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Robert L. Taylor [*See page 245*]

Nymphea, Peachblow

Rambling Along the Delphinium Path

LEON H. LEONIAN

The literature on delphinium seems to be full of contradictions, and the average gardener becomes confused, discouraged, and decides to try some other flower easier to grow. As a matter of fact, however, the contradictions are not real; they merely represent the experiences of the individual author. Such experiences are gained under different environmental conditions, and since delphinium culture is greatly modified by the environment, it is no wonder that what may be the ideal condition under one set of environment, may easily become the least desirable under another. Thus, while in warmer regions the ideal location for delphiniums is a northern exposure and afternoon shade, full sun all day long, and therefore, a southern or eastern exposure is the best in cooler climates. The prospective delphinium grower should scan the literature more critically and follow the recommendations of the person who lives under conditions similar to his own. Then he will have no false impressions and no bitter disappointments. When Watkin Samuel developed his strain with flowering spikes five feet or more in length, it became the ambition of everyone to grow such giants in his garden. I know of one grower in Canada who purchased a number of named varieties from Mr. Samuel and hopefully watched for those long spikes to develop under Canadian conditions. The longest spikes that he ever got measured less than two feet. Even in England, only a few miles from Wrexham, the varieties regularly throwing up five foot spikes rarely grew to be three feet. In Mr. Samuel's garden, I understand, the soil is so deep and loose that one can push a walking stick all the way down without exerting much force. A deep, rich soil, cool climate, abundant moisture and good cultivation bring out all the good qualities of delphinium. But how many people can boast of such conditions? Such being the case, one should expect from delphiniums no more than one's environment will allow.

The color of the flowers is also subject to modifications under different environments. This applies particularly to the blue shades. If the season happens to be cool, pure blues without a trace of any other shade come to gladden the heart of the gardener; but if the season is warm, the blue becomes contaminated with hues of lavender.

Pests and diseases of delphinium are also greatly modified by the environment. The cyclamen mite, for instance, is most active during cool seasons, and rarely shows much effect when it is unusually warm. Mildew is not a factor in warm, dry climates, but where it is cool and the atmosphere moist, it becomes a serious menace. High altitudes and cool climates check crown rot, the most dreaded disease of delphinium; in warmer climates these rots play havoc with delphinium.

The foregoing suffices to show the importance of environment on delphiniums. Once the would-be grower of delphiniums appreciates this, it will not be difficult for him to modify his cultural practices according to his climatic and soil conditions and thus achieve at least a fair amount of success. Since in this country delphiniums are propagated largely by means of seeds, let us begin with seeds and end with them. It will not be possible to go into great

detail, but we will hit the high points and outline a working program.

Delphinium seeds lose their viability unless they are kept in tightly stoppered vials and placed in the refrigerator. Not being well insulated like many other seeds, they rapidly give off their precious moisture and loss of vitality follows. This important factor should be kept in mind when the seed is sown. If, during the first two weeks, the surface soil is allowed to dry for even a short time, the seeds perish and no seedlings will show up. On the other hand, if there is too much moisture in the soil, again there will be no or few seedlings because an overabundance of moisture means oxygen shortage and a subsequent failure. If covered too deeply, delphinium seeds will not form seedlings because they will be unable to push their way up through the soil crust. This explains many a complaint made by the purchaser. "Seeds harvested from my own plants came up very well; not one of your seeds came up." Chances are that he used forceps and carefully spaced the seeds for which he paid a high price, whereas his own seeds were sown thickly and without too much fuss. The combined force of crowded seeds sufficed to push the crust up, whereas singly placed seeds suffocated for lack of force to push their way up. However the situation is not always as simple as this, and many other factors come in to complicate matters. For instance, a gardener sows his seeds in August and failing to obtain a good germination complains to the seedsman. He receives replacements and this time he gleefully reports a 100 per cent germination. He received the same kind of seed, from the same container; why did he fail the first time and succeed the second time? Blame it on the weather: early in August it is usually too warm in many parts of our country, and delphiniums do not germinate well when the temperature is too high and, in addition there is little or no rainfall. By the time the customer receives his replacement it is September; the days are cooler and the rains more abundant. The delphinium-wise customer waits until the arrival of cooler weather. If it is too late for fall sowing, he waits until early spring. But what are we going to do with the customer who reports as follows: "Seeds purchased from X came up 100 per cent, while yours failed to come up at all." And in the same mail there will be a letter to the effect that "your seeds came up 100 per cent, those of X failed to give a single seedling." In such a case all one can do is to grin and bear it. The environmental conditions vary so much not only in different parts of the gardens but even in different parts of the same seedbed that it is impossible to make an intelligent analysis.

But what of the seedbed? Here again we are dealing with a physical and chemical environment that is going to determine the success or the failure of seedling production. If the soil is too acid, there will be no seedlings; if it is too alkaline, there may be seedlings but they will develop chlorosis and perish. I prefer a neutral or a slightly acid soil. The texture of the soil should be loose to provide water and air drainage. Sand, coal ashes, peat moss, and sphagnum moss are very good substances to lighten the soil. Woods' dirt should be avoided because it contains substances harmful to delphinium. Sawdust, manure, and domestic peat moss come under the same category, at least under some conditions, and therefore it is safe to avoid them. Soil taken from under the sod is the best, because it is less likely to carry harmful substances, or micro-organisms which attack dephinium.

During the early phases of germination and up to the appearance of the first true leaves the danger from damping-off organisms is very acute especially in case of indoor sowing. There are many ways of avoiding this, good, bad, or indifferent. Heat sterilization should be avoided because heated soil liberates elements that are toxic to delphinium seedlings. Formalin treatment of the soil is effective but requires a certain amount of skill, otherwise more harm than good ensues. Sphagnum moss, rubbed through a sifter, furnishes the ideal medium in which to grow delphinium as well as many other seedlings. If one does not intend to transplant the seedlings as soon as the first true leaves appear, he may use only about two inches of sphagnum moss on top of the soil; otherwise pure sphagnum moss will do very well. If allowed to go dry, sphagnum moss forms a crust through which water does not penetrate very readily. Therefore care should be taken to keep it moist but not soggy.

It is advisable to keep the flats or the cold frame protected against rain. Heavy rains beat the seedlings down and make them easy prey to certain soil-inhabiting fungi. Continuous rains encourage such fungi, and what promised to be an excellent stand of seedlings ends up with no seedlings at all. Many gardeners have suffered such losses but few know why.

Seedlings resulting from fall-sown seeds should be provided with some protection against winter. The cold frame, or the flat in which seedlings are grown should be covered with wire-screen to keep out insects and animals; mulching material may then be added.

Transplanting should be done as early in the spring as possible. It is best to transplant the seedlings into paper or wooden bands, allow them to establish themselves, and then set them out, band and all. Where seasons are long, this may be done in the fall. Late transplanting and the use of bare-root seedlings cause much loss because often there may be a dry period in the spring, or an unseasonable period of high temperature. Any seedling that is not well established may be lost.

Lime or fertilizer should not be used at the time of transplanting. It should be delayed until after the seedlings are well established; or it should have been done the previous fall.

Usually the best display is made the second year. In regions where delphiniums continue to grow all winter, the first year seedlings attain the maximum beauty. Under sub-tropical conditions delphiniums bloom once and then die. Where seasons are short, delphiniums bloom once a year but continue to live and to thrive year after year.

There has been much agitation about developing delphiniums that will require no staking. Where high winds, and particularly wind-driven hard rains are not known during the delphinium blooming time, one may expect to have delphiniums to stand up with a minimum of protection; otherwise staking is essential no matter how tough the spikes may be. A 3-foot flowering spike is pretty heavy; when loaded with rain, it becomes still heavier; but when rain and wind join their forces, no spike in full bloom can withstand the pressure. Bamboo canes afford excellent protection; one cane should be used for each spike.

There seems to be a general impression that delphinium flowers are pollenized by insects, especially by the bumble bee. This is not true. In the greenhouse, where there are no bees, delphiniums produce an abundance of seeds. Emasculated flowers outdoors, exposed to the visit of bees, moths, and humming birds, rarely, if ever, set seeds. The anthers mature one by

one, or two by two, never all together. First they become erect and thus touch the inner surface of the curving petal (eye). The discharged pollen sticks to the inner surface of the petal and the old anthers wither away to make room for the others. By the time most of the pollen has been discharged, the stigma pushes its way up and by coming in contact with the pollen-laden surface of the petal is automatically pollinated.

Since delphinium is self-pollinated, it follows that unless cross-pollination is used, propagation by means of seeds will not give the desired results. Flower lovers are advised to purchase only such seeds that result from cross-pollination by hand. It is true that such seeds are, of necessity, higher priced, but it is equally true that scrubs or aristocrats require the same amount of space in the garden, and the same kind of care. Why not have the best?

Lycoris squamigera (*see page* 242)

Bamboos for American Horticulture (I)

Robert A. Young

The economic possibilities of bamboo on an agricultural crop basis in the South have been dealt with both broadly and in some detail by Mr. E. A. McIlhenny in his own excellent articles in the January and April numbers of this magazine. In the following pages and, it is hoped, in later issues, I shall attempt to indicate something of what may be done further with bamboos in horticulture. Only a beginning has been made in the possible utilization of bamboos in the horticulture of the continental United States and in our nearer islands, Puerto Rico and Hawaii. This is accounted for largely by the very small number and limited distribution of indigenous bamboos and the complete absence among them of species adapted to horticultural uses; there are no native bamboos in Hawaii, and only a few unimportant ones in Peurto Rico. (*Bambusa vulgaria,* introduced rather early into Puerto Rico, is established in many localities at low altitude, especially along water courses.)

Other reasons why we of the mainland have not more quickly and generally taken to bamboo growing for decorative purposes (and for the edible young shoots) are suggested by the striking differences in habit of growth and in appearance between bamboos in general and any of our commonly grown horticultural plants except some of the larger grasses. There are also the limitations on successful culture, in many of the more northern or inland areas, imposed by susceptibility of the plants to serious injury from occasional sub-zero temperatures in winter. Without these periodic and destructive "lows" the plants would thrive continuously over a larger area.

The bamboos, as is well known, are woody-stemmed perennial plants belonging to the grass family, Gramineae, subfamily Bambusoideae. They are rather sharply distinguished from other grasses in having their leaves with a well-defined petiole and in bearing their leaves on branches instead of directly on the culm—except the tip of the culm, which functions as a branch and does bear leaves. Below these leaves gathered at or near the tip of the culm, the "leaves" become culm sheathes, the blades of which, in descending order, are gradually reduced in size and character until they cease to function even temporarily as true leaves. In many bamboos, and especially the larger species, the culm sheaths are early deciduous, but in several groups of hardy species, these sheaths are more or less persistent.

More than fifty genera of bamboos are recognized and the total number of described species and varieties throughout the world is probably near 1,000 at this time. More species, particularly from China but also from tropical America and other regions of the world, are being described every year. Flowering is exceedingly variable among the bamboos. In a few species it may occur at intervals of only a few years and without resulting death of the plants—unless seed production is profuse, which often it is not. The period from seedling stage to flowering is recorded for relatively few species but is known in some instances to be at least fifty to sixty yeas. In cultivation, therefore, propagation is effected solely by division of

the plant or of one of its parts—culms or rhizones.

As was indicated in Mr. McIlhenny's article in the January number, there are two general types of bamboos, "clump" and "running"—terms indicating the manner of growth and the rate of spread of the plants. In the first type an underground stem, or rhizome, grows from the base of a culm (vertical stem, or cane) and, with little or no horizontal growth, turns upward to form another culm. From the base of this new culm another rhizome soon starts, likewise turning upward, and so on indefinitely until flowering or some other fatal event occurs. This gives the more or less dense arrangement of the culms characteristic of the clump type. In allusion to the mode of rhizome and culm development, bamboos of this type are said to be of "sympodial" habit. The second, or running, type has rhizomes that in general run horizontally underground for a considerable distance and either never or only rarely turn upward at the tip. They give rise to culms from lateral buds at certain of the nodes, thus forming gradually—sometimes rather rapidly—an extended thicket. The terminal bud of a running rhizome may die after a certain length or age is reached, and when it does a branch rhizome grows from each one or more lateral buds immediately behind the tip. Such a case is shown on an adjoining page. In reference to this second node of rhizome development the running, or spreading rhizomes are said to be of "monopodial" habit.

In some of the groups of bamboos with monopodial rhizomes the mode of development is intermediate between the types described, and in certain of these the two types are combined in the same plant. An example of the latter is found in our southern switchcane, *Arundinaria tecta*, and is illustrated on another page. Bamboo rhizomes are all jointed, consisting of nodes and internodes, much like the culms but with internodes shorter and much thicker walled—sometimes nearly solid. The true roots develop in a whorl from each node of a rhizome and of the culm base.

It will be the purpose of this series of papers to illustrate and briefly describe some of the more important or well-known bamboos of different sizes and habits of growth at present cultivated in the United States.

The Hardy Running Bamboos

The distinctly hardy bamboos, with which we shall first be concerned, are mostly evergreen at temperatures down to 5° Fahr. or a little lower, but at about zero the leaves of even the hardiest are killed, and at a few degrees lower the stems are partially or completely killed. It is perhaps of interest to mention here that the leaves of all the distinctly hardy bamboos—those of the temperate zone—have conspicuous lattice-work, or tessellated, venation, which is easily visible under an ordinary hand lens. The culms normally live for several years and when all are killed, by cold or other means, the size of those produced in the succeeding season will be much smaller. The hardy bamboos send up their new shoots in the early weeks of really warm weather in spring, provided the ground is reasonably moist. A shoot develops into a culm of full size in about six weeks, though the wood is at first very soft and only attains its maximum density and strength gradually during the first three years of its life. During the period of elongation the culms are very delicate at the nodes and only by the support of the tough, tightly encasing sheaths are they enabled to withstand the lateral stresses caused by ordinary winds.

Branching Rhizome of a Running Bamboo of the Genus Phyllostachys. The nine branches in view grew from lateral buds at nodes of the rhizome (underground stem) immediately back of the terminal bud when the bud died. *(See page 172.)*

These hardier bamboos are mostly native to China and Japan. At least two species, however, of the very widespread and diverse genus Arundinaria are endemic in our southern states, and there are others in certain parts of

Rhizomes and lower sections of culms of the Switchcane, Arundinaria tecta, showing clump development of culms in conjunction with running rhizomes. (*See page 172.*)

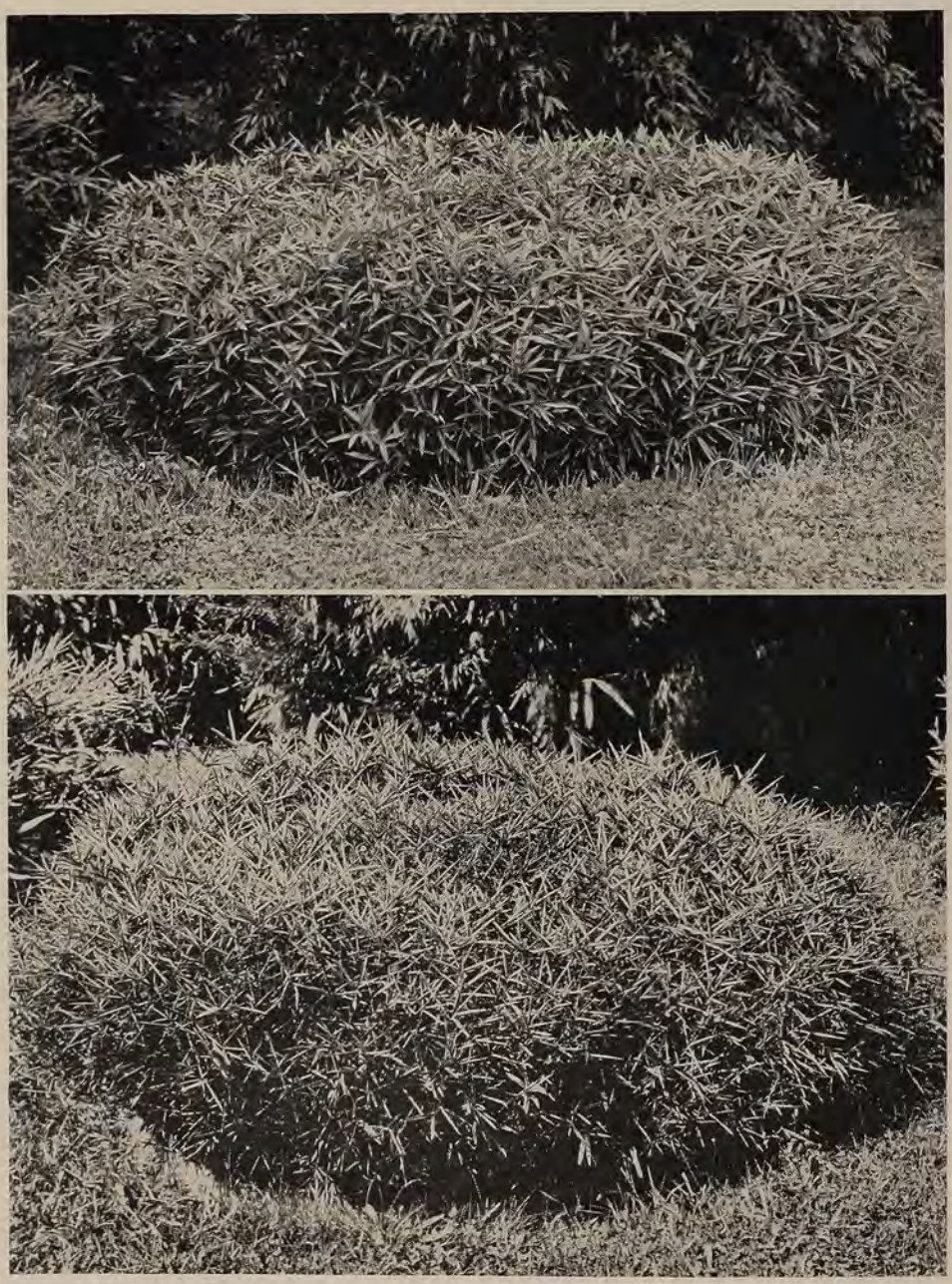
tropical America, tropical Africa, and the mountains of southeastern Asia.

Other genera of hardy bamboos besides Arundinaria of which representative species are now in cultivation in the United States are Phyllostachys, Pseudosasa, Sasa, Semiarundinaria and Shibataea. However, with the exception of Phyllostachys, generic lines in this large group are not too clearly drawn, and for this and other reason there has been and doubtless will be further considerable transfer of species by botanists from one genus to another. The final status and the correct names of some of the bamboos to be discussed are therefore uncertain. In these cases synonyms will be given, which should help to prevent possible misunderstanding as to the identities of any of the plants being considered. The genus Pleioblastus, erected in 1925, is at present considered by some authorities to be of doubtful validity and in this paper it is recognized only in synonymy. Of the several hundred species and varieties of hardy bamboos already described, the greater number grow only a few feet high and relatively few of these possess qualities likely to give them much economic or ornamental value, especially in the United

A group of six species of running bamboos grown in "clumps," with roots confined, at U. S. Plant Introduction Garden, Glenn Dale, Maryland. Foreground: Arundinaria graminea. Center: Sasa chrysantha (left); S. pumila (right). Background: Pseudosasa japonica (left); Phyllostachys nigra var. henonis (center); Shibataea kumasaca (right).

States. In the present article attention will be given almost entirely to the hardy bamboos—mostly rather small —of the genera mentioned above other than Phyllostachys. They will be treated, as far as practicable, in order of size, the smaller being considered first.

The photograph on this page shows a small part of a collection of hardy oriental bamboos, grown in circular "tanks" 5 feet in diameter—filled with soil and without bottoms — at the United States Plant Introduction Garden, Glenn Dale, Maryland. The tanks are for the purpose of keeping the running rhizomes from spreading into adjacent areas. They are formed from galvanized iron sheets 26 inches wide



Sasa pumila, a dwarf running bamboo, with roots confined. Above: with leaves normally expanded; below: with leaves curled, or rolled, inward from heat of direct sunlight. (Plants 26-28 inches high.)

Shibataea kumasaca, a unique broad-leaved bamboo—roots confined—with ovate-lanceolate leaves. The new culms, with leaves not yet fully expanded, dominate the center and right side of the clump.

and are sunk that distance into the ground. Running bamboos with their rhizomes thus confined grow in an artificial clump form and should be clearly distinguished from those that grow naturally in compact clumps. These plantings were about 5 years old when the photograph was taken. Incidental-

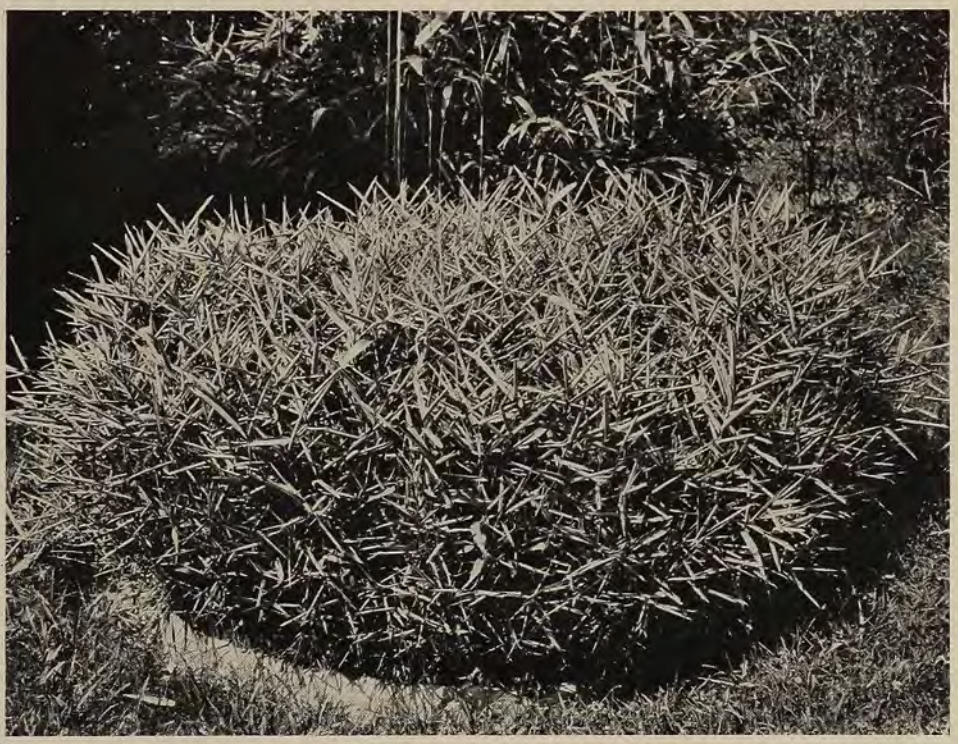
ly, the temperature at Glenn Dale in some winters falls to between —10° and —15° Fahr., and rarely as low as —23°. In light soils the rhizomes of some of these bamboos may grow under such a barrier and come up on the outside, and there is always the probability that those of all the running species will come to the surface and go "over the top" into the soil outside and continue to spread, unless watched and cut off when they start to go over. In some central background of this photograph is a developing "clump" of one of the giant hardy bamboos, *Phyllostachys nigra* var. *henonis* (Mitf.) Stapf ex Rendle, and at the left of this, the larger-leaved and shorter-culmed *Pseudosasa japonica* (Sieb. & Zucc.) Makino. These will be referred to again elsewhere.

Arundinaria graminea (Mitf.) Makino, in the foreground of the photograph, is only 3½ feet high here but is reported to reach 9 to 16 feet in localities with a less rigorous winter climate. (A good mulch in winter will prevent or at least reduce cold injury to the rhizomes.) The leaves of *A. graminea*, as can be seen and as the specific name suggests, are distinctly grasslike—4 to 10 inches long and from less than a quarter to scarcely a half inch wide. Botanical synonyms for this species are *A. hindsii* var. *graminea* and *Pleioblastus gramineus*. The plant is a native of Japan but was introduced into this country from a European source, as have been most of our other oriental bamboos of small and medium size. One of the Japanese names for this species, Taiminchiku, is said to mean "Great Ming bamboo."

Sasa chrysantha (Mitf.) E. G. Camus (*Arundinaria chrysantha*), a larger-leaved species at the left and behind *Arundinaria graminea*, has here grown to nearly 5 feet in height. Its maximum is probably a little taller. Branches arise from the upper nodes of the culm, bearing 5-7 oblong-lanceolate leaves, 3-7 inches long and up to ¾ inch wide. A bamboo of this character, although definitely a runner, can rather easily be kept in clump form without curbing the rhizomes by simply cutting during the sprouting season the shoots that appear outside of the allotted space.

Sasa pumila, to the right of *S. chrysantha* and shown also in two closer views on page 176, is a dwarf species, growing to a height of about 2 feet in cool climates or in partial shade in warmer ones. It branches rather freely from the upper nodes of thec ulm and each branch bears 4-7 oblong-lanceolate leaves 1½-3½ inches long and ¼ to nearly ⅝ inch wide, gathered near the tips of culms and branches. The leaves tend to curl, or roll up, in dry and sunny situations in summer, as shown in the lower photograph on page 176. In very warm situations, with mild winters, the entire plant, including the leaves, becomes so much reduced in size and appearance as to cause one to suspect its being of some different species. Because of its small size and rampant rhizomes, *S. pumila* may easily become a weed; it is very difficult to eradicate when it escapes into a garden and especially when it invades a lawn.

Shibataea kumasaca (Steud.) Nakai, appearing at the right, back of *Sasa pumila* in the photograph previously mentioned and in a close view on page 177, is a broad-leaved little bamboo 3 to 6 feet high. Other names, but without botanical standing, that have been used in the literature for this species are: *Shibataea kumasasa* (variant of *kumasaca*), *S. ruscifolia*, *Phyllostachys kumasaca*, *P. ruscifolia*, and *Bambusa viminalis*. This bamboo is a native of Japan. There are usually 3 to 5 dark-green, ovate-lanceolate



Arundinaria viridi-striata, a dwarf bamboo—roots confined—with yellow-striped leaves; the leaves curl in bright sunlight. (Plants 28 inches high.)

leaves at each of the upper 8 or 10 nodes of the slender culm; they are 1½-3 inches long and are usually terminal on very short branches—which commonly range from ¾ to ½ inch in length but rarely considerably longer. The leaves suffer more or less injury at temperatures below 10° F., but if the rhizomes have been protected by a winter mulch, full recovery will take place during the early summer. The plant is not a very rapid spreader. In Japan it has a half-dozen different common names, the one preferred apparently being Okamezasa.

Arundinaria viridi-striata [Regel] Makino ex Nakai is the name now accepted for an attractive dwarf bamboo with leaves that are striped green-and-yellow in spring and early summer; later in the summer the yellow striping tends to disappear and the leaf to become all green. The plant, native to China and Japan, is 1½ to 2½ feet high, and the culms, with their 1 or 2 long ascending branches from near the base, bear 3 to 5 leaves 2 to 5 inches long and ½ to 1 inch wide, mostly clustered near the apex . The leaf is glabrous—free from any hairiness—on the upper surface and shortly velvety-pubescent beneath; it curls in strong sunlight. The leaves are all killed even in the milder winters at Glenn Dale, and the development of the new leaves in spring is a little slower than in most dwarf bamboos. However, the plant will make a handsome ground cover where the climate is not too severe. Some of the rather numerous synonyms by which this little bamboo has been known are: *Bambusa*

viridi-striata, Arundinaria variabilis var. *viridi-striata, A. variegata* var. *viridi-striata, Pleioblastus viridi-striatus, Arundinaria auricoma,* and *Sasa auricoma.* The Japanese common name for it is Kamurozasa.

Sasa variegata (Miquel) E. G. Camus, the handsome little Japanese bamboo shown on page 181, has leaves conspicuously striped with white or creamy white. *S. variegata* has been reported to grow only 1½ to 2 feet high, but the culms of the plant grown at Glenn Dale have attained slightly over 3 feet in height. Branches arise, somewhat irregularly, from one or two nodes of the culm the first year and others come later. The white-striped, oblong-lanceolate leaves, well rounded at the base, are finely pubescent beneath; they are 5 to 10 in number, usually gathered near the culm tip and the tips of the branches and are from 2 to 6 inches long. The plant is a little more cold-resistant than the preceding. While the identity of our present plant has not been previously questioned, it now seems to me possible that an apparently similar species described under the name *S. argenteo-striata* (Regel) E. G. Camus (transferred by Dr. Nakai to Pleioblastus) may be involved. The height of our plant coincides with that given for *S. argenteo-striata* and the leaf variegation indicated that it seems to agree, but there are also points of disagreement. Since the true identity of the plant under consideration is at present in doubt, it is of course useless to give synonyms for the name *S. variegata* here. I shall hope to get the question cleared up later.

Sasa pygmaea (Miquel) E. G. Camus, as its name implies, is considered to be one of the smallest of the bamboos. It is native to Japan. In some environments, especially in a warm climate, it seldom exceeds 6 to 10 inches in height. The plants in the road border shown in the accompanying photograph at Biltmore, North Carolina, were within this range, though in another location culms about 18 inches tall were collected. The oblong leaves, clustered in numbers of 3 to 7 at the apex of culm and branches, are 1 to 3 inches long by 3/16 to 7/16 inch wide; they are shortly pubescent beneath. This attractive little bamboo in its proper place might prove valuable as a ground cover in situations where ordinary grasses do not thrive. Because of the slenderness of its stems it may even be possible to mow it. Should it invade an ordinary lawn, however, it would doubtless make real trouble for the owner. *S. pygmaea,* originally described as *Bambusa pygmaea,* has since had three different designations in the genus Arundinaria and, more recently, has also been placed in Pleioblastus. Its Japanese name is Keoroshimachiku.

Sasa disticha, (Mitf.) E. G. Camus is an attractive, fern-leaved, hardy bamboo, native to Japan. It grows in time to heights of 3 to 5 feet in a very favorable environment such as that at the Biltmore Estate in North Carolina, shown in the photograph on page 183. The fern-leaf character in bamboos results from a reduction in size of leaf simultaneously with an increase in the number of leaf-bearing nodes and a shortening of the length of the internodes, so that the natural 2-ranked arrangement of the leaves is accentuated. The degree of development of this character varies considerably and it occasionally tends to disappear when growth is unusually vigorous. The small planting at the Biltmore Estate was 38 years old according to Mr. C. D. Beadle, who has been in charge of the horticultural work there from the beginning and by whose courtesy I was enabled to take this and other pho-

Sasa variegata, a dwarf bamboo—roots confined—with white-striped leaves. (Plants 2 feet high. Phyllostachys viridi-glaucescens in background.)

tographs, in 1935. It had spread comparatively little in all that time. This is a very dainty-looking bamboo in its smaller stages of development, as when grown in a pot.

There is some question as to the correct botanical status of this bamboo and it is possible that its treatment as a variety of the preceding species, *pygmaea*, as has already been done by Dr. T. Nakai, a leading Japanese botanist, will become generally accepted. However, he placed it in the genus Pleioblastus, which in this paper is being recognized only in the synonymy. The fact that *S. disticha* is generally recognized as growing to considerably larger size than *pygmaea* seems to me to give some reason to question the correctness of considering it only as a variety of the latter. For these reasons I have chosen here to accord the plant specific rank, using the original specific name. Following are some of the other names by which it has been known in the past: *Bambusa disticha; Arundinaria variabilis* var. *pygmaea; A. variabilis* var. *disticha; A. variegata* var. *oroshima; Pleioblastus variegatus* var. *oroshima; P. pygmaeus* var. *distichus*. The Japanese name for this bamboo is Oroshimachiku, meaning Oro Island bamboo. It is said to be grown mostly as a pot plant in Japan.

Sasa veitchii (Carr.) Rehder, of which a little group of plants is shown on page 184, is a dwarf broad-leaved bamboo from Japan, with leaves roughly resembling in shape those of *S. palmata* but much smaller and quite distinct in detailed characters. The little culm sheaths are at first densely white-hairy, which serve to help in identification. The leaves, dark green above and glaucous beneath, are usually oblong, 2 to 7 inches long and ⅝ to 1½ inches wide, broadly tapering or rounded at the base, and with 5 to 8 pairs of secondary veins. There is a tendency of the leaves to decay on the margins and turn brown to whitish in the later autumn or winter. This is very striking and characteristic in some situations, and when the first description was published the plant was given the varietal name *albo-marginata* under *Phyllostachys bambusoides*, to which it is, of course, unrelated. The plants in the photograph are 15 inches high and represent average growth, though it is reported that in England culms have sometimes attained heights of 3 to 4 feet. Near Savannah, Georgia—a warmer climate—the average height has been scarcely 12 inches, and it is undoubtedly better adapted to cooler conditions. This little bamboo, in a small planting, can be kept in attractive appearance during the summer and early autumn by the removal in spring of dead or injured leaves and stems. It can also be useful as a ground cover for somewhat larger areas in some situations. *S. veitchii* was first described as a species as *Bambusa veitchii* and later was for some time known as *Arundinaria veitchii*. In the meantime, after the publication of the name *Bambusa veitchii*, the varietal name *albo-marginata* was raised to specific rank, in the genus Arundinaria, by the eminent Japanese botanist Dr. Tomitaro Makino. This action was invalid under the rules of botanical nomenclature, however, in view of the prior publication of *B. veitchii*. The combination *Sasa albo-marginata*, made later by Makino and Shibata, is invalid for the same reason. The Japanese common name for *S. veitchii* is Kumazasa.

Sasa tessellata (Munro) Makino & Shibata, a large-leaved, very low-growing, species from China, shown on page 185, has the distinction of bearing probably the largest leaves of all known bamboos. The height of the plant is only 2½ to 3 feet, but the leaves have

Sasa pygmaea, a very dwarf bamboo, bordering curve of road on the Biltmore Estate, Biltmore, N. C. (Plants about 10 inches high.) Sasa disticha, the dwarf hardy Fernleaf bamboo, beside a road on the Biltmore Estate. Ordinarily a much smaller plant, its tallest culms in this semi-shaded situation are nearly 5 feet high.

Sasa veitchii, a dwarf broad-leaved running bamboo, growing usually to only 15 inches or less in height.

Sasa tessellata, one of the largest-leaved of all bamboos but of low stature, rarely taller than 3 feet. (Roots confined.)

measured from about 10 to as much as 23 inches in length and from 1¾ to 3½ inches wide, at Glenn Dale, Md. W. J. Bean, in England many years ago, reported leaves even broader, though not so long. In shape the leaves are oblong, tapering broadly at the base and rather narrowly to a sharp point at the apex. They are medium green above, glaucous beneath, and are regularly 2 in number at tip of the culm the first year, there being no branches developed that year; the midrib is conspicuously yellowish. The culm is rather short-jointed, there being 2 internodes about 4 inches long near the base, with the higher ones gradually shorter, and the smooth, brownish-yellow culm sheaths are respectively from 1½ to 3½ times the length of the internode above the attachment. The plant is interesting in a collection of bamboos but can not be rated as very ornamental under ordinary conditions. This unique bamboo, originally named *Bambusa tessellata* by Colonel Munro, was stated by him to have been described from only "the dried leaves of this species when sewn together and in the state so largely used by the Chinese in packing their tea." It was introduced into Europe before 1845, probably the first of the bamboos from China or Japan. Other synonyms of *S. tessellata* are *Arundinaria tessellata* and *A. ragamowskii*.

Sasa palmata (Mitf.) E. G. Camus appears at present to be the correct name for the handsome large-leaved Japanese bamboo pictured on page 186, which for some time we have supposed to be *S. senanensis* (Fr. & Sav.) Rehder. The latter species is considered by Dr. T. Nakai to be a quite different plant, which has not yet been introduced into this country, so far as I

Sasa palmata, one of the larger-leaved bamboos, growing here to about 5 feet high. Old U. S. Botanical Garden, Washington, D. C.

know. The transfer of the species *palmata* to the genus Sasa by Camus (in 1913) was done defectively, as was the similar subsequent and independent action of Nakai (1934), and the status of the name is still unsettled. The plant that we are here calling *S. palmata* is one of the most striking of the medium-low hardy bamboos. The culms, curving upward from the base, often grow 5 to 6 feet tall and in very favorable situations will reach 7 or 8 feet. Branches arise singly from some of the middle and upper nodes of the culm and later a secondary branch may grow from the base of a primary. The leaves, bright green above and glaucous beneath, are borne in palmate clusters of 3 to 9 at the apex of the culm and the tips of the branches. They are

Arundinaria longiaurita, a large-leaved bamboo with internodes of culm very long and nearly solid. Height of plants up to 5 feet. U. S. Barbour Lathrop Plant Introduction Garden, near Savannah, Georgia.

among the largest in bamboos, measuring up to 15 inches long by 3½ inches wide and being exceeded in length, I believe, only by the leaves of *S. tessellata*. They are oblong to oblong-lanceolate, tapering broadly at the base. The secondary veins, 8-12 in each side of the midvein of the leaf, are very prominent, especially when viewed with transmitted light, and enhance the beauty of the plant. The culm sheaths are nearly all much shorter than the internodes. The entire plant is free of hairiness or pubescence. This bamboo is generally neat in habit and makes an exceedingly attractive appearance where mass effect is desired and where the winter climate is not too severe; it is but little injured at temperatures above 5° F. When it becomes ragged, as it will, it may sometimes be desirable to cut out part or all of the old growth in the early spring. Besides the misidentification of our plant as *S. senanensis*, it has been known at various times, in Europe or in Japan, under the synonyms *Bambusa palmata*, *Arundinaria palmata*, *A. paniculata* forma *chimaki-zasa*, *Sasa paniculata*, and *S. australis*.

Arundinaria longiaurita (Hand.-Mazz.) Hand.-Mazz., another broad-leaved bamboo from China, shown on this page. It occurs in the wild in the

Pseudosasa japonica, the well-known Metake, at the old U. S. Botanical Garden, Washington, D. C. Plants up to 7 feet tall.

Lungtau Mountains, where it is called by the Chinese, Tip mo chuk. The plants in the photograph are 3 to 5 feet high but heights up to 12 feet in the above region were reported by Dr. F. A. McClure, who collected it there. The rather rough culms, up to 5/8 inch in diameter, are tough and have very long internodes with extremely small cavities. The taller culms bear stiff upright branches but usually only on the upper part and should therefore be es-

Arundinaria simoni. A planting of a medium-sized form of this variable, narrow-leaved species as grown at the U. S. Barbour Lathrop Plant Introduction Garden, Savannah, Georgia. The tallest culms here are about 8 feet high.

pecially useful for small plant stakes. The leaves are oblong, 5-10 inches long and from less than 1 inch to nearly 2 inches wide. The plant is hardly to be considered ornamental. This bamboo has but one synonym, *Indocalamus longiauritus*.

Pseudosasa japonica (Steudel) Makino, still widely known under its earlier name, *Arundinaria japonica*, is believed to be the earliest of the hardy oriental bamboos to be introduced into the United States. It came, of course, by way of Europe, sometime after 1850, and it probably is still the best known and most widely grown species in decorative plantings, especially in the more northern areas in which bamboos thrive. An attractive group of plants that grew in the old U. S. Botanical Garden shortly before it was moved to its present site is shown on page 188. Besides the rather handsome leaves, evergreen down to about 7° F., and the ease of growing the plant, the comparatively slow spreading of the rhizomes is a characteristic by which this bamboo doubtless has largely earned its popularity. It more nearly "stays put" than almost any other hardy bamboo that might otherwise have competed with it. The erect culms commonly grow from 6 to 10 feet high, even where they are killed by cold every few years, and in warmer localities they sometimes reach 16 feet or more. Semi-erect branches grow singly from some of the upper nodes, and these, with the apical section of the culm, bear clusters of 4 to 11 narrow-oblong leaves 5 to 13 inches long, wedge-shaped at the base; they are glossy dark green above and somewhat glaucous beneath. The culm sheaths, except at the lower nodes, are about as long as the internodes or longer; they are stiff-hairy at first, later becoming smooth, and they adhere until they decay. Other synonyms of *Pseudosasa japonica* are *Bambusa metake*, *Arundinaria metake*, and *Sasa japonica*. The accepted Japanese common name for our present plant in Yadake, though it presumably at one time also was called Metake, by which name we recognize it in this country.

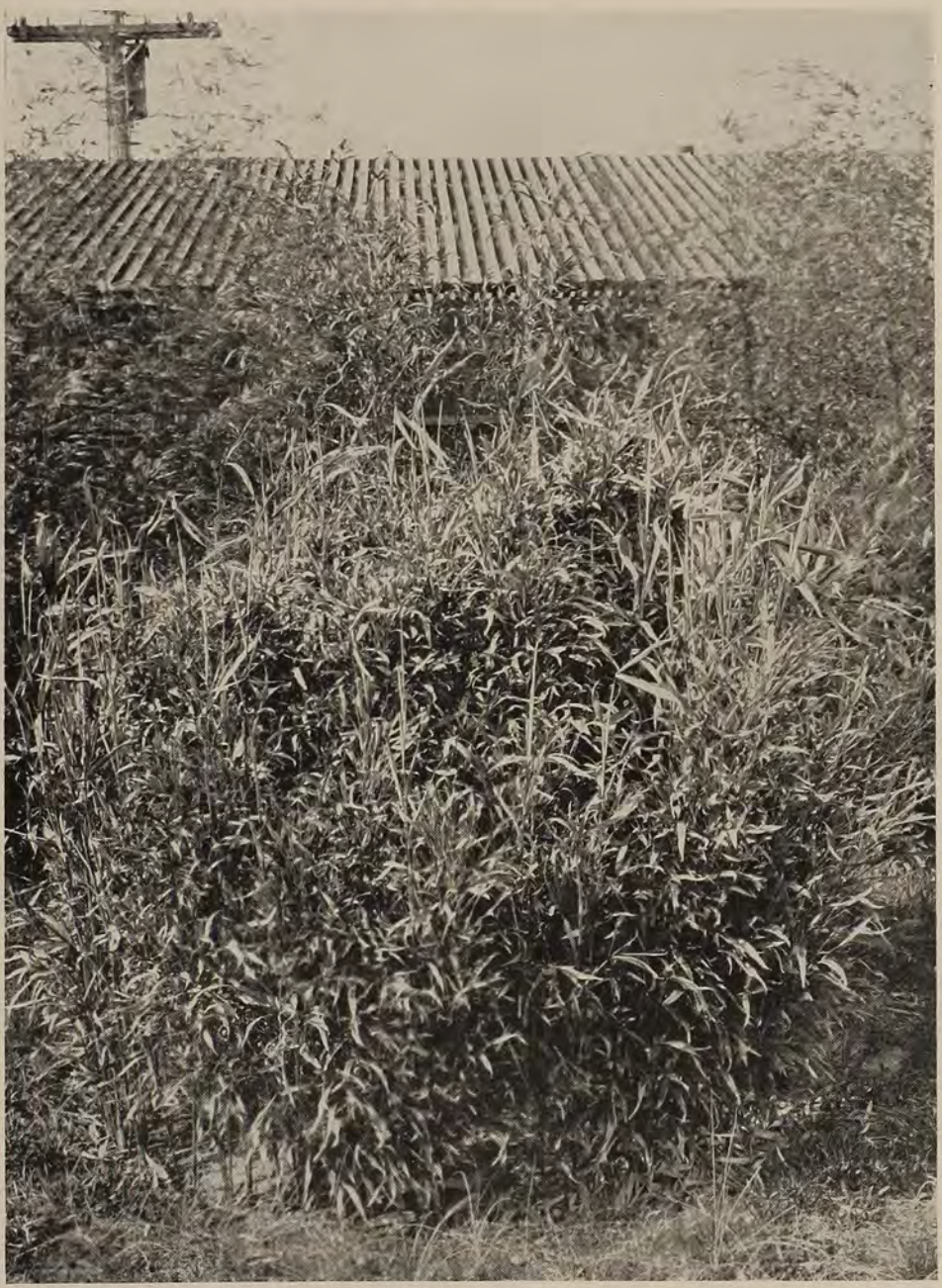
Arundinaria simoni (Carr.) A. & C. Rivière, a variable bamboo from Japan, as shown on page 189, represents one of the several forms the species assumes, supposedly by way of its seedlings. This one, being grown at the U. S. Barbour Lathrop Plant Introduction Garden, near Savannah, Georgia, was received about 18 years ago from Florida; it had been obtained earlier from a European source. This is a form of medium stature, the tallest culms being about 8 feet. A more dwarf form—not over 5 feet high—of *A. simoni* is known in Florida, also a much larger and more vigorous one, the latter reported to have much promise of value for certain industrial uses. The tallest culms of this exceed 20 feet in height. A report has also come recently from New Jersey of a small planting of a form similar in stature to the larger one in Florida, though it probably is hardier. It is not completely hardy in New Jersey but the height of culms reported—20 feet—seems to indicate a high degree of cold resistance. While I do not think of *A. simoni* as a very ornamental bamboo, the absence of any strong tendency to run in the two smaller forms mentioned above is a point in their favor where limited spaces are being considered. The tall form from Florida, however, is a more active spreader. The leaves of *A. simoni* are narrow-oblong, sometimes almost linear, from 3 to 12 inches long and from ⅓ to about 1¼ inches wide at most. Occasionally a white stripe appears. It has been pointed out recently that the original description of the species provided for

Semiarundinaria fastuosa, the Narihira bamboo, one of the handsomest of the medium-sized hardy bamboos. The tallest culms here are 19 feet high. U. S. Barbour Lathrop Plant Introduction Garden. (Photo by D. A. Bisset, U.S.D.A.)

Arundinaria gigantea, the canebrake bamboo. This form of the species, growing beside a road on the Biltmore Estate, does not there exceed about 14 feet in height.

striped leaves, as well as for great variation in comparative width of leaf. Notwithstanding this fact, the botanical varieties *variegata* and *heterophylla* were later published for the stripe-leaved form and the forms in which both the very narrow and the wide leaves are conspicuously present. It would seem more appropriate to treat these simply as horticultural varieties, without separate botanical status. The Japanese name for *A. simoni* is Medake (which should never be confused with Madake, *Phyllostachys bambusoides*, or with Metake, *Pseudosasa japonica*.)

Arundinaria simoni var. *variegata* Hook. fil, which might be called the silverstripe bamboo, not illustrated. It originated in Japan and is distinguished from the type by having usually rather small, very slender, and more or less white-striped leaves. The variety grows much taller and is more vigorous in rhizome activity than the smaller forms of the type (plants with nearly all plain green leaves); it more nearly approximates in stature and



Arundinaria tecta, the Switchcane. This form of the species, grown with roots confined, at the U. S. Plant Introduction Garden, Glenn Dale, Maryland, is one of several rather distinct ones occurring in different parts of the southeastern quarter of the country.

vigor the larger forms of *A. simoni* that have recently come to our knowledge. The leaves of the silverstripe bamboo are extremely variable in their proportions and in the degree of striping. Many leaves have a single stripe, either threadlike or much wider, while others have 2 or 3 stripes or may be entirely green or, occasionally, almost entirely white. They are from 2 to 7 inches long and from about ⅛ to ½ inch wide. Both shorter and longer leaves may be either very narrow or quite wide. At times, some leaves may be entirely green and almost as large as in the type. The plant has limited possibilities as an ornamental. Synonyms by which this variety has been known are *Arundinaria simoni* var. *albo-striata*, *A. simoni* var. *striata*, and *Pleioblastus simoni* var. *variegatus*.

Semiarundinaria fastuosa (Mitf.) Makino is the stateliest, if not the handsomest, of the hardy bamboos. Narihiradake, the Japanese name for it, has allusion to the general appearance of the plant, as does also the Latin specific name, *fastuosa*. Narihira is said to have been a sort of legendary Beau Brummel. We may call the plant the Narihira bamboo. The culms grow ultimately to heights up to 25 feet or more in a mild climate. The rhizomes are less active than those of most running bamboos, which results in slow spreading. The smaller culms are generally densely clothed for almost their entire length by the rich dark-green, oblong to oblong-lanceolate leaves, which are from 4 to 7 inches long and are borne on short, rather upright, branches. The smooth straw-colored culm sheaths often hang on in a semi-detached state for a number of weeks after the new culms have completed their growth and are quite characteristic during that period. The species fortunately is one of the hardiest and withstands temperatures almost to zero F. with little injury. Like most other running bamboos it can be kept within almost any desired limits by keeping all shoots cut back that appear outside the set limits. There are many other things that might be said concerning this splendid bamboo but space does not permit. The synonyms are *Bambusa fastuosa*, *Arundinaria fastuosa*, *A. narihira*.

Native Bamboos of the South

The native bamboos of the southeastern quarter of the United States are hardly subjects for ornamental horticulture but I think they may at least be mentioned when the subject of bamboos in the United States is being considered.

Arundinaria gigantea (Walt.) Chapm. (*A. macrosperma*) is the large bamboo of the famous canebrakes that a century and more ago covered considerable areas in many sections of the South. A photograph of part of a small original patch of this species on the Biltmore Estate, Biltmore, N. C., appears on page 192. The greatest height of culm here was about 14 feet. Leaves on mature culms measured 1½ to nearly 5 inches long and 3/16 to ½ inch wide. Much farther south—from South Carolina to Louisiana—heights up to at least 30 feet undoubtedly have been common in former years. Occasionally it has been reported that in the early days canes nearly or quite 40 feet high were found, but in the abscence of evidence that actual measurements or even very careful estimates were made, I doubt that full acceptance of the reports is justified. Whether the comparatively low stature of the form at Biltimore is due mainly to climatic or soil factors or to differences in the bamboo itself can only be surmised but all three of these considerations may well be involved. It would not be strange if there were geographical forms of the species. While the

Arundinaria tecta var. decidua, a variety common in western North Carolina, which drops its leaves in the autumn, with Mr. C. D. Beadle who originally described and named it. *(See page 196.)*

plants shown in the photograph are not distinctly ornamental, I believe that there may well be situations in which a small patch would be of interest and not seriously disfiguring. In regard to the question of a common name for *A. gigantea*, it has long seemed to me that one more distinctive than any used or yet proposed should be found and brought into use. The word "cane," which is a part of all the names used thus far, is in too general use, not only for other large grasses but for parts of other plants. I propose here the name "canebrake bamboo," which seems to me both distinctive and descriptive.

Arundinaria tecta (Walt.) Muhl., the switchcane, or small cane, seems probably to be a composite species or, at least ,a species with rather numerous geographical forms. Mr. Beadle of the Biltmore Estate has made numerous observations and collections of foliage specimens of several diverse forms at different points in the Southeast as steps toward the resolving of the question of what *"A. tecta"* really is or comprises. The specimens are in my care. The photograph on page 193 is of a form of *A. tecta* received from the Royal Botanic Gardens, Kew, England, which they had obtained a great many years ago, under the name *A. macrosperma*, from this country. More than one observer, however, in examining the bamboos at Kew, had noted that this plant was much more like *tecta* than *macrosperma*. The locality of its original collection in this country is not known, I believe. Plants of this form grown at Savannah, Georgia, have leaves 1½-4½ inches long and 3/16-½ inch wide on second-year culms; leaves on first-year culms are larger, with length of 3-7 inches. *A. tecta*, like many other bamboos, is not adapted for ornamental plantings in general, but where there is particular interest in bamboos, one or more of the forms might well be included in a collection if desired and if they could be obtained.

Arundinaria tecta var. *decidua* C. D. Beadle is a deciduous variety which Mr. Beadle states is common in western North Carolina. It is found on the Biltmore Estate, beside the French Broad River and bordering small watercourses that flow into it several miles above Biltmore. The name, with a brief description, was published in Bailey's Standard Cyclopedia of Horticulture, 1914 edition, but I have found no other references to it in the literature. The plant differs from the most closely similar nondeciduous forms of *A. tecta* especially in its deciduous habit. The variety at this place—the type locality, altitude 2,200 feet—grows to heights scarcely exceeding 4½ feet. Its leaves are 2-7 inches long and 3/16-⅝ inch wide. They turn yellow and fall in the autumn. This little deciduous bamboo has not been known to flower in the fifty years during which it has been under observation by Mr. Beadle. It was my good fortune to visit the type locality of *A. tecta* var. *decidua* in company with him at the beginning of September in 1935 and to take a photograph of part of the small patch, with him standing among the plants. This is shown on page 195.

Hemerocallis through the Year

J. B. S. Norton

One of the few flowers that can be depended on for bloom throughout the growing season is the daylily genus. A selection of suitable varieties will yield flowers from late April to frost in October in the climate of Washington. They can be carried further as house plants in November and later, and perhaps in early spring.

The number of clones of hemerocallis that have published names is now close to 1,000, and many new ones are coming into culture each year. Some of these differ little from one another, but the variation in color, form, size, and season in this genus is so great that there is a possibility for tens of thousands of quite distinct varieties. So if one is to keep a garden collection within reasonable limits, a great many kinds must be omitted.

However, with all this wealth of new material, the common wild Europa and its related double variety, with a few lemonlilies in spring and maybe a late lemonlily in July is about all we see in most gardens. How slowly new flowers come into use!

The following selections for all blooming seasons are from one man's observations on a collection of some 300 varieties, with visits to a number of other gardens, including the daylily collections at the New York Botanical Garden and at Reading, Pennsylvania. The best of each color type was selected for each week in the blooming season. They are listed here in seasonal order of the time blooming begins. The most of them bloom for three to six weeks.

Many outstanding new kinds could have been included had they been better known. Very few of those originated by the writer are mentioned; the proverb, "Let another man praise thee," is a good guide in plant breeding. But one of the easiest ways for any one to satisfy his own desires in the search for beauty is to pick his choices from a field of hybrid hemerocallis grown from seeds.

One of the earliest daylilies to bloom is the rather dwarf, orange Dr. Regel. Some of the early May varieties are tall for the season: of these, the yellow flowered Elizabeth may be mentioned.

The second week of May brings in Tangerine, orange color, and the yellow, large flowered Earliana.

The third week of May has the greatest wealth of spring bloom in the hemerocallis garden. The bright orange Aureole, dwarfish, with rather narrow petals; the light buff Sovereign with brown tinge on the outside of the buds; and the long and profusely blooming Apricot, with light yellow wide petals, frilled on the edges, are old, well tried varieties of this period, blooming through to the end of May or early June. Among the host of yellow and orange May bloomers the red and brown summer colors have been moved back in Buckeye with large blocks of brown on the petals as in Mikado, and in later May, in Brunette, which is red brown all over.

There is a gap in daylily blooming the last of May and first of June. The masses of flowers about May 25 suddenly disappear, to be gradually renewed through June by more and more of the summer blooming kinds. But several fine varieties begin to flower then, and mass plantings of them can fill the need. Semperflorens is the best yellow. It has a strong and beau-

tiful plant, the scape well branched with many buds, the flowers wide and full, from late May to mid June. A very excellent large flowered orange of good form is Sungold. Domestica and Ajax are other fine, large, orange colored bloomers of this mid season between spring and summer blooming hemerocallis.

Gaiety is a very large, pale yellow, making a striking display, but the segments are too long to meet well. Modesty is a smaller but better formed lemon of the first week of June.

The yellow and orange selfs seem to please most gardeners better than the newer reds, browns and mixed colors, but those looking for newer and different colors and color combinations will begin to see them by June tenth. Bagdad begins then with a peculiar mixture of brown and orange. A brilliant red of novel tone comes in Creamore Henna. Hannah Dustin is a light yellow of beautiful form in this period. Estelle Friend, a somewhat fulvous bicolor, may also be mentioned.

The middle of June introduces a greater variety. The seedling rows of this season show wonderful variation of many colors and forms. Among a few of the best named varieties are the small summer *H. multiflora* hybrids, tending to have rounded segment tips; Bijou and Saturn. *H. aurantiaca major* is a big, red tinted orange. Bicolor, petals rosy red and sepals yellow is one of the best bicolors.

The light yellow, smooth petaled Patricia begins to flower the last half of June. By many it is placed among the highest rating daylilies. Europa, introduced and wild all over the world, one of the oldest varieties known, is still fine in form and vigor, if not in color; its glory somewhat dampened by being so abundant and aggressive, flowers in late June and early July. Another of late June is Mikado, yellow, with large, brown patches on each of the three petals; for years the highest rated daylily. J. A. Crawford is a good large yellow of this blooming season.

The last week of June gives us one of the very best light yellows, Hyperion. Ophir, a stronger yellow, vies with it for the top place in yellows, and blooms about the same time. The garden is so full now of fine large yellow flowered hemerocallis, it is hard to know which to omit. The very large Mongol and Golden West may be added to those above. In other colors, Port is a good red; Burgundy a well formed brown; Peony Red is a near crimson; Frances is a peculiar orange brown with a well formed rather flat flower. Others of late June are the exquisite orange pink Afterglow; Triumph, a red orange of great vigor, continuing to bloom into September; and Caballero, another fine bicolor.

Here near Washington, early July is the peak of the daylily season, with more varieties blooming, and a greater variation in form and color than at any other time in the year. Of those not already mentioned and still in flower, Golden Fulva is a good red orange. Theron is almost black; a novel color, but one that makes it very inconspicuous in the garden. La Tulipe has wide dark red petals and yellow sepals, and the beautiful form so well shown in Shull's design on the cover of the 1941 Herbertia. Maculata is the most conspicuous clone of *H. fulva*. The best of the few doubles is Kwanso, a near relative of Maculata. Another double of this season is more attractive for its clearly white striped leaves than for the flowers.

Near mid July, Palemoon is one of the best light yellows. Aztec Gold is one of the most attractive of daylilies, with strong many-flowered scape and rich orange colored flowers of some-

what orchidlike irregular form. Rajah is one of the finest reds, with darker areas about the throat. Another good one of mid July is Gloaming, of unusual color, a buff, shaded dull orange red.

Just after the middle of July, when the mass of many colored varieties is beginning to decline, some of the finest kinds flower as a late mid-summer rear guard. Rosalind, highly prized as a near rose pink derivative of *H. fulva rosea,* is one. Another *H. fulva* is the orange red Cypriana. The orange buff Vestal with darker throat spots, continues to bloom into September. Mrs. W. H. Wyman, a small flowered, late yellow, is an old timer, still worthy. Many promising new kinds, not yet fully tested help to fill this late summer period.

Later in July, August Pioneer, the first good August bloomer out of *H. multiflora,* begins flowering. It has small, yellow flowers, pinkish tinted on the petals, and so is a scarcely noticeable bicolor. The related Boutonniere may also be included here. Jean Watson continues to bloom profusely from late July until the middle of September. It is another slightly bicolored flower of rather unhappy yellow and pinkish. Queen Bess is quite similar. Chengtu, orange red, can be justified in the vegetable garden as the one most used as food, though many others are liked by epicures. The buds, ready to open, are parboiled, the water poured off, and the buds then cooked with salt, pepper, and butter. Some of the yellow flowered species have a slightly irritating taste.

A number of those already mentioned continue to flower during August and part of September. Several good clones not yet introduced begin to flower in August. Autumn Prince, with many small light yellow flowers is still blooming the middle of October, as is Hankow an orange red of *H. fulva* parentage.

Some of the May blooming varieties begin again in September and October and insure some bloom till frost, but can not be depended on, as their flowers are poorer and stems softer than in spring. Hybrids of Hankow and other late bloomers promise to give us some really fine late fall varieties.

With the multitude of new hemerocallis being introduced each year, any list must be tentative, and vary with climate, location, and individual tastes. The large number of new kinds should not be deprecated too much, as many of them are certain to be improvements on older ones like them, the possibilities in breeding this flower having only begun to be realized.

But the general garden must be limited to a small number that can find room among other desired ornamentals. The following reduced list is what the writer would select to start anew on a small place, arranged in seasonal order from early May to October: Dr. Regel, Earliana, Semperflorens, Sungold, Bicolor, Patricia, Mikado, Hyperion, Ophir, Afterglow, Triumph, Theron, Maculata, Aztec Gold, Rajah, Rosalind, Autumn Prince, Hankow. Some finer newer kinds are omitted on account of high price and lack of experience with them.

Gardening with Daylilies

J. Marion Shull

The average American gardener is not yet aware of the Garden Magic lying easily within his reach, provided by fairly recent development in the field of Hemerocallis. True there have been daylilies time out of mind, and they must have been well thought of long ago to have received that appellation, Beautiful-for-a-day, but their true capacity for garden service is still only appreciated by a few.

We garden for many and varied reasons; some of us are artists bent on making pictures to delight the eye; some work like the jeweler to create the perfect gem of an individual bloom; some, like the scientist, searching for understanding through all the varied wonders of plant growth and development; and some for rivalry of fellow gardeners, proud of producing the biggest or best and prone to take prizes at the flower shows. But there are a few rare souls in whom are united all these motives and more and these live in their gardens even when absent from them. So versatile is the Hemerocallis now that it can satisfy in great measure all these aspirations.

It is no longer just the "yellow daylily," though you may still find people who insist that the only daylily for them must be yellow. To others the name daylily brings no answering peal from the belfry because they have known none but the tawny *Hemerocallis* fulva, ubiquitous, aggressive, extremely variable if not temperamental. At its best this common flower is wonderful, but next day, next week, next season it may be dull and uninspiring. It can not be used with assurance. It is more subject to this moodiness than any other daylily I know, more so even than many a garden variety derived largely from it as an ancestor. The reason for this uncertainty of behavior does not seem to have been fully fathomed. Perhaps the investigative eye just hasn't yet been turned upon it with sufficient intensity. My own guess would be that it is partly response to temperature rather than a matter of brittle temperament. And why not? Since the flowers of Hemerocallis last normally only for a day or perhaps only for a portion of a day it follows that no two successive daily crops of bloom are produced under precisely the same conditions of sunshine or shadow, temperature, humidity, or general sequence of climatic change. The individual bloom goes through tremendous change during the last twenty-four hours, that period between advanced bud and full blown flower and all the indicated climatic variables bring their influence sharply to bear during this brief period. Most noticeable effect in yellow flowered sorts is that of size alone as the yellow color is not greatly affected, but ruddy colors are often greatly affected by low temperatures.

Contrary to the usual experience with other garden flowers, that cold heightens the color, in Hemerocallis the reverse prevails. Low temperature reduces strong colors but darkens or muddies delicate colors, and dulls all of them, not that this information will be of any particular help in planning the use of daylilies in the garden, but most gardeners do prefer to understand rather than merely observe and wonder.

This unhappy fluctuation in color quality of *Hemerocallis fulva,* from day

to day and from season to season, plus its weedy aggressiveness by reason of which it has spread all over the world thus making for the too close acquaintance that breeds contempt, has placed something of a stumbling-block in the way of the lovelier and more garden-useful things now pouring from the gardens of the breeders. Mention daylilies to the uninitiate and a common response is "Yes, I know the daylilies —but don't care much for them." Then you find they know only the tawny daylily in its semiwild state and never even thought of it as anything but a rather dull roadside weed. And they probably know, and like, the "lemon lily" of their Grandmother's garden, but never thought of it as a daylily, so prone are we to be governed by words alone.

Now we have dozens and dozens of good garden varieties of Hemerocallis that continue in discreet clumps for years. These are excellent garden material for the artist whether he would create his garden pictures along the line of the Hudson River School with its devotion to minute detail or performs with the great broad strokes and splashes of the Impressionists. Pigments for the picture are available in almost infinite variation from pale lemon yellow through cadmium, gold, orange to bright red, bronze, maroon and blackish purples, also numerous bicolor combinations of these. No longer are we confined to a monotony of yellow.

A few colors are not available, and probably never will be. A true white is apparently beyond the reach of the breeders, and a yellow burned white by the sun is no acceptable substitute, and of course there is no proper blue. While many of the reds advertised as such are not really red but varying degrees of brown, golden brown, red brown, and so on, nevertheless they are often very lovely and heart warming things. On the other hand some of them are just plain dull and unsatisfactory for garden use. There are also blackish reds that tempt one to call them purples but they are not really purples either.

Crimson would seem to be beyond our reach also, but reds of the vermilion type are not only attainable but already available to some extent, but the critical prospective buyer of anything advertised as red would do well to see these novelty things in bloom before actually buying, for often the word descriptions are defective or even misleading whether intentionally or not. Buy these then on sight—unless of course you enjoy gambling and don't mind losing occasionally, for the successful garden picture depends upon intimate acquaintance and detailed knowledge of the peculiarities and possibilities of each item used. Each must be fitted into the general scheme where it can perform at all times to the greatest advantage.

If we know for instance that Anitra burns white in the hot sun of midafternoon we need not for this reason forego its other fine qualities if we bank it at the east of a hedge or wall where it will be shielded from the sun during the most trying hours of the day.

Suppose now we consider the ideal daylily garden, not that anyone is urged to make a garden of nothing but daylilies, but such is their variety and loveliness of color and form that many a garden might properly make them the dominant feature at least for the month of July. More than likely the garden will be viewed from the central area. Perhaps the approach will be by a central path, winding or formal as may fit the likings of the maker, or determined by the size and shape of the area under consideration, whether a confined and tiny city back yard or an ex-

pansive lawn or field. In any case a garden is likely to have its definite metes and bounds marked by hedge or wall beyond which you will know instinctively the garden does not go. Here then is the perfect setting for daylilies.

If the garden is to be a knock-out in daylily time the master gardener will keep one habit of all Hemerocallis well in mind, the proclivity to face its flowers always toward the strongest light. At the north of a building or northward from towering foliage masses the flowers turn their faces toward the north even though at considerable distance from the obstructions. This provides the key to the effective use of the great majority of the strong colored or particolored varieties. By and large only the complete selfs, which are mostly yellows, can be used to advantage in full open places where light is approximately equal from all directions. There the flowers will face in all directions within the same clump or bed, some facing, some turning their backs to the observer.

It will be found that most of the reds, browns, or other dark varieties, though not all of them, are decidedly two-faced after the manner of the Radiance rose, and this becomes important in planting for landscape effect.

Varieties like Harlequin, Carnival, the brown Emperor Jones, the blackish-red Vulcan, the somewhat redder San Juan darkened as with a mixture of black, the bicolor La Tulipe and many others, all carry their rich strong colors only or at least predominantly on the inside or face surfaces of the petalage, the outside or reverse often remaining plain yellow in extreme contrast with the face color. These varieties are not at all effective as seen from the rear and good garden usage demands that they be backed up against some foil sufficiently high and obstructing to light to ensure their turning all their flowers one way and toward the observer in which case they may become very showy indeed. Even the yellow varieties like Dumortierii, that show reddish coloration on the reverse of the petalage are better in the over all landscape effect if placed with this same consideration. The darker color seen from the rear dilutes or degrades the general mass effect.

Since all the double faced sorts are to be planted with their backs to the wall it becomes all the more important to consider their height before placement in the border so that the tallest may stand behind and look over their shorter companions. With heights varying from eighteen inches or less to five feet or more, it is now possible to build where desired an almost solid wall of daylily bloom from the ground up to eye level with great latitude for harmonious color effect within the area.

Except for propagating rows and rows of new seedlings coming into their first bloom, my own garden is almost exclusively devoted to this method of border display so that a visitor moves toward the middle of the garden and from that vantage point is greeted by hundreds of daylily blooms whichever way he may turn. He may approach more closely to examine some beauty in more intimate detail but wherever he goes within this charmed circle their faces are turned toward him as if seeking his admiration and approval. It is definitely the artist's approach to his garden.

But if the garden is diminutive, as must sometimes be the case, or if you prefer the jeweler's approach, the appreciation and enjoyment of minute perfection, you may still retain the charm of marginal planting, but instead of the central path let us say there is a belt line just comfortably inside the circle or border of daylilies. Then we

shall select not only for color and freedom of bloom but for the gem-like quality of the individual flower. Here also there is wide range for the connoisseur of loveliness. Most people are still not aware of the great variation in form provided by Hemerocallis. They are not only vastly variable in form and size of petal but in manner and carriage as well. Occasionally they turn up as freaks, more grotesque than beautiful, but only the breeders see these as they get culled out before the gardening public becomes aware of them.

Nearly all varieties show a certain amount of irregularity but some, like Duchess of Windsor, light creamy yellow with a faint but broad eye-zone and very broad petals, present almost the perfect symmetry of a fine broad petaled Narcissus. At the other extreme one segment, usually a petal, may be thrust out like a great mocking tongue while the other five curl back into near circles. A full sister of this may present a nearly symmetrical figure with segments not markedly recurved at all, while the mother of both, with equal symmetry, shows all six segments rolled back into almost perfect ringlets. Petals may be long and narrow and the flower correspondingly spidery, or broad and full as in Golden Glow and Duchess of Windsor. Segments may be broader in their outer portion as in Musette, or may taper narrowly to a point as in Vulcan.

Suggested by Waubun there is a type of bloom, regular or irregular, in which the petalage is elongated and takes on a twist as well as curl, well exemplified in Theodore Mead, very intriguing to an artist and in extreme cases becoming almost bizarre. So your jeweler's gem may be almost anything in form and carriage as well as color.

But form and carriage and color are not all. They vary in texture also. The surface may be smooth or creased, crinkled or creped as in Duchess of Windsor or Gipsy Lass, ruffled margins as in the latter, or microscopically embossed to appear spangled as with gold dust. So if the jeweler's approach is yours you may indulge your fancy no end.

If your garden satisfaction demands the stimulation of co-partnership with Nature in the creation of new and possibly better things you will take the scientific approach and join the slap-happy group of amateur breeders bent on seeing what you can do that Nature didn't and perhaps shouldn't. And this may prove the greatest gardening fun of all, provided of course that you are the happy possessor of a sound mind, a healthy sense of humor, and the rare gift of unbiased judgment, a gambler at heart yet sufficiently calm and poised to turn a keenly appraising eye on your own contributions to horticulture.

The fascination of seeing something new come into bloom for the first time, something whose ancestors you have been personally responsible for, brings a thrill that is hard to match anywhere else in the whole avocation of gardening. There are so many paths to explore in this matter of breeding, so many opposing characters to work with in daylilies, desirable qualities to combine in one individual, undesirable to eliminate while retaining the desirable ones. A wonderful gamble—and no money out.

Available factors in the genus Hemerocallis provide for a lifetime of garden amusement. There are the tall and the short, broad petals or narrow petals, curly or straight, smooth or crinkled, and the endless variation of color and color pattern. And with a little juggling one may even mate the early with the late, with anybody's guess as to the outcome.

Among desirable qualities always worth trying for are clarity and loveliness of color, color that will not burn or fade in the sun, color that will not spot in rain, though rain damage is a minor fault since always the rain spotted flowers will be replaced by new and unspotted flowers on the morrow.

Likewise of importance is the number of flowers per stem. There is some variation of course due to growing conditions of the moment, a weak stem under crowding or poor nutrition naturally carrying fewer flowers than a strong stalk of the same variety, but altogether aside from this environmental fluctuation there is a definitely hereditary factor as well. The fine English variety, George Yeld, at its best in my garden has never yielded more than eleven flowers to the stalk. On the other hand my best stalk of Cherokee Maid produced fifty-three, nearly five times as much bloom as from George Yeld. These free flowering sorts require no more garden space and no more coddling or care than the inherently shy bloomers. They simply give more for less a fact lying deep at the heart of all economics.

I have said nothing as yet for the solace of the gardener who gardens for rivalry and wants to win prizes at the shows. For these there are varieties that may at their best reach a spread of eight inches as they naturally stand, to contrast with perfect little gems of less than two inches. But shows are often held at night so the ambitious prospective exhibitor will want to include some of the night-bloomers. Only a few of the daylilies remain open the whole twenty-four hours or longer, and there are others whose life is only nine hours or less. Of strictly day-bloomers, Hemerocallis fulva is one of the shortest lived, gets up late and goes to sleep early, is not fully awake until about nine o'clock in the morning and begins closing by six in the evening. And a night-blooming seedling of my own scorned the sun altogether, did not open until after dusk and closed again before the dawn. But even this found acceptance in a friend's garden filling a niche near a lighted terrace where the family often sat well into the night and enjoyed its blooming.

But these are extremes. Many of our good garden varieties are fully open by daybreak and remain in good display till ten or eleven o'clock at night in no way shirking their garden service. However, if cut flowers are wanted for indoors at night you will need night-bloomers like the fine Calypso that opens toward evening and remains in good condition till mid-forenoon of the following day, or may use full twenty-four-hour bloomers like the old familiar lemon lily, or the Duchess of Windsor that lasts nearly till break of day.

Some people tend to be shy of daylilies because the flowers are so short lived, but this is mostly a psychological phenomenon. For myself I feel that it gives the daylily garden an added charm and piquancy. Here you have half a thousand blooms today in an arrangement that will never again be duplicated. Tomorrow you will have half a thousand again, but they will be in different proportions. Here today are juxtaposed half a dozen yellows and a dozen reds or golden browns. Tomorrow the same two clumps may have reversed themselves, presenting a dozen yellows and only half that many of the stronger color, and so on endlessly, or at least to the end of the season. I think of my daylily garden as a stage where over night invisible stage hands tirelessly sweep away the preceding show and set up a completely new one for the day to come. And no two days are alike.

Chevy Chase, Md.

FOUR GARDEN SCENES

FROM THE WORKS OF

MISS ANNE BAKER

BRONXVILLE, N. Y.

Most garden pictures are built for a moment, whether that moment be extended in time or not, but in planning the Birch Walk, without a doubt there was recalled the one fine moment in winter when the effect would be of white on white, a moment as difficult as the picture planned solely in greens. *(See page 206.)*

A green picture for all its lilacs and tulips and promise of color to come, in the foreground beds and success or failure here depends on foliage contrast and on lines of growth. *(See page 207.)*

If one could divorce his sense of color from his seeing, he might realize in fact as he does in this photograph, that it is the mass of light, of broken light and of shadow that make this garden scene. *(See page 208.)*

Here one feels masses and to accentuate as well as to bring contrast, the roughly surfaced stone is perhaps better than anything else, stone almost of the character that might be found in nature, in the field near by and not set free from the encroaching plant growth that crowds in, as in any hedgerow. *(See page 209.)*

Walter B. Wilder

". . . when the effect would be of white on white. . . ."

"A green picture for all its lilacs and tulips . . ."

". . . of light, of broken light and of shadow. . . ."

". . . encroaching plant growth that crowds in. . . ."

Winter Gardening at Cushing General Hospital

KATHRYN S. TAYLOR

Of all the arts and skills which are being used in the rehabilitation of service men in Army and Navy hospitals, gardening is among the most effective though difficult to put upon a satisfactory working basis. The chief reason for this is that the daily routine of the average patient does not allow him to give plants the rather constant attention over a continued period of time which they require. In a skill like rug-making, the rug does not suffer in the long intervals when it remains untouched. Plants cannot shift for themselves during similar periods, and this fact must be recognized when any sort of garden project is under consideration for a hospital. This is particularly true when a winter garden project is suggested, and commanding officers should not be encouraged to accept the gift of a regulation type of greenhouse, if to be used exclusively by patients, unless the responsibility entailed is fully understood.

The sun-heated pit is one type of greenhouse, however, which can survive periods of enforced neglect and still present a creditable appearance. That at Cushing General Hospital in Framingham, Massachusetts, is a recent gift of the Garden Club of America and it demonstrates this fact very well. It is attached to an occupational therapy workshop and is used by patients, some of whom are not well enough to go out-of-doors. The behavior of this pit, and the contrast between it and one not attached to another building, should be of interest to many gardeners who would also have a winter garden if they could be assured that they need not always have someone on hand to care for it.

It might be well to explain briefly what is meant by a sun-heated pit. The excavation for a pit greenhouse extends from 3 to 4 feet below ground depending upon the amount of drainage required. The excavation is lined with a cement wall or hollow tiles. The pit faces due south, and that side of the structure above ground is made of 3 by 6 foot hot bed sashes slanted at an angle of 45°. The north side is a shingled roof. This side and both ends have double walls with insulation in between. Doors and other openings for summer ventilation are also insulated. The glass is covered with quilted pads and straw mats at night. It is uncovered after the sun comes up in the morning and covered again before the sun sets in the afternoon. On cloudy days nothing is done except to turn on electric lights inside. There is no other source of heat unless the temperature goes well below zero. Then, nothing more powerful than the heating unit of an electric sunbowl will furnish protection. The approximate temperature (night) of an unattached pit in severe weather is 33° to 35° F. If it is attached to a building, it is usually about ten degrees higher. A very small amount of heat will raise the temperature in the former to 40° F., which is what many plants prefer. The width of the pit is fixed by the angle of the glass to about eight feet. The length depends upon the number of hot bed sashes used. There is eight feet of head room under the ridge. A bench for plants along the south side of the pit is just below ground level, and a 3-step staging along the north wall allows room for tall plants like camellias and azaleas.

The sun-heated pit at Cushing is 22 feet long. Although during the winter months such structures are intended to be worked in only in sunny weather, the patients here work almost every day. Since there is no sun to furnish heat in cloudy weather, a small radiator has been fastened to one wall. It is used only when the men are there. Patients work for an hour and a half in the morning and usually for another hour or so in the afternoon. The rest of the day, and on week-ends, the pit has largely to shift for itself. The fact that it can do so without serious harm coming to the plants is thoroughly appreciated by the Army officers who have it under their jurisdiction. A description of what happened to the pit over the recent Christmas holidays well illustrates this important point. All patients connected with the project had 10-day leave, and the corpsmen who uncover the glass and help with the ventilation were also absent over the holiday week-end. The pit remained covered for a period of three days, and a sergeant looked in but once to see that all was in order. Six of the seven sashes were covered with three 6 x 6 foot thin quilted pads. Although three 6 x 6 foot straw mats were available to give further protection, they were not used, and the seventh sash was never covered at all. The insulated door at one end, being new, had swelled so that it would not shut tightly and it had not yet been planed down. The heat was turned off and the door into the workshop was closed. In spite of all these disadvantages, and although the temperature outside descended close to zero during this period, the inside temperature went no lower than 39° F. This was a surprise to everyone concerned and proves the value of this type of house in the present crisis when fuel cannot be spared for greenhouses. The plants were all in good shape and did not object to being in darkness for several days. They were watered twice in the ten days while the patients were away. It would have been difficult, if not impossible, to find anyone to give much attention to the pit during the holiday season, and if a regulation greenhouse had been given to Cushing the plants would certainly have been dead if like treatment had been advised.

Only those patients who want to work in the pit are asked to do so. Usually they know little about gardening at the start, and often, just as they acquire the knack, they become well enough to be discharged from the hospital. Consequently, every few weeks a new group of patients takes over who must be taught from the beginning. The plants are therefore frequently subjected to adverse treatment, and it is stimulating to find ways to guard against as many accidents as possible. On one cold day, a corpsman who noticed the temperature in the pit approaching 90° opened one of the sashes right beside the plants and left it so for an hour. The icy draught blowing directly on the tender growth of snapdragon and oxalis nipped a goodly number of shoots beyond repair. To obviate such happenings, "do not" signs such as "do not open this window," "do not water this plant," etc., are placed at strategic points and have helped greatly. There is a maximum and minimum thermometer in the pit, and its readings are recorded every morning. The lowest temperature so far was 36° F., and the highest 96° F. The average night temperature is 44° F., and the average day temperature is between 65 and 70° F. A chart is kept of when plants are sprayed and fertilized. Liquid cow manure and Electra are used alternately. The only complete failures so far experienced

were coleus plants in water tight pots. Being watered as frequently, by one beginner after another, as plants in porous pots, the water actually stood on top of the soil most of the time. The coleus soon succumbed and their place has been taken by more worthy subjects.

All of the plants in the pit have been donated by generous friends. Many of them were purposely in the seedling stage to provide work for the patients in bringing them to the flowering point. Some fine chrysanthemums in pots were provided for immediate effect, however. The boys have carried the seedlings on surprisingly well and visitors are truly impressed. Plants which require cool conditions were chosen for the pit, but a greater variety could be grown here because of the extra warmth furnished by the pit's location and the presence of the small radiator.

Many seedlings came from a detached pit only a few miles away, and their response to the different conditions in the two pits is interesting. *Primula malacoides* is in full bloom in the warmer pit and just showing color in the cooler one. Winter-flowering forget-me-nots and violets are in full bloom, and do better in the colder pit. They blossom, but are not so sturdy in the other. They have not blossomed any sooner, even with more heat (It is now early in January). Annuals, like schizanthus, are a little too cold in the detached pit and do much better with some heat. Camellias blossom a bit earlier in the warmer pit. While many plants like geraniums are resting in the colder pit, all such plants are making growth in the other. A plant of *Cypripedium insigne* has a flower in good condition after being in bloom for thirteen weeks. This seems a fine record for amateurs to achieve.

When the Garden Club of America gave the sun-heated pit to Cushing, the writer's services were included in the arrangement to see that the project got off to a good start. She spends two mornings a week with the patients, and this relieves the Army officers and the Occupational Therapist of responsibility which might otherwise become too much of a burden in their overbusy lives. The patients enjoy the pit more when not left entirely to themselves and their individual interests are noted and catered to as much as possible. They are taught the routine care of plants, as well as seasonal activities like the making of winter cuttings.

Gardening with men returned from the world's battle fronts is a privilege not to be taken lightly. All of them are heroes who are extremely modest about their accomplishments. Often, before they leave the hospital, they voluntarily speak of the effect their experiences have had upon them and express gratitude for the opportunity of working among the flowers. They insist that the pit has been of inestimable value to them in their struggle back to health. This is not hard to believe because the improvement shown is obvious. Several are planning to build pits when they return home. Surely no other reward is needed for one's efforts and it is a great source of satisfaction to have this small part in the big task of rehabilitation.

The Beginning of Pecan Growing as an Orchard Industry

Clarence A. Reed
Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture

Pecan growing as an orchard industry upon a varietal basis was born in 1846 or 1847, when the first trees of that species were grafted. In 1876 this grafted variety was named Centennial. The grafting operation was performed by a slave gardener named Antoine (pronounced An-twan) on Oak Alley Plantation, which faced the Mississippi River from that part of St. James Parish, La., which is on the west side of the river. The parent tree from which the scions were obtained then stood in Anita Plantation of the same Parish but on the east side of the river. It was destroyed in 1890 by a disastrous crevasse which swept away not only the tree but also the soil to a depth of 15 feet.

Altogether 16 trees were successfully grafted by the slave during the first winter. This number became 126 within the next two decades with the grafting of 110 more trees in a pasture on the same plantation "40 arpents" from the mansion. Following the close of the Civil War (1865) all but two of the grafted trees were cut down by a new owner of the plantation in order to make room for sugar cane. As the two trees allowed to remain stood on the mansion grounds, it is reasonable to assume that they were among the very first to be grafted. The better of the two was photographed in October 1902 by William A. Taylor, then a pomologist in the Bureau of Plant Industry, U. S. Department of Agriculture, by whom these historical data were ferreted out at that time. The full account as written by him was published in the Department of Agriculture Yearbook for 1904 (pages 407-408).

According to Taylor's account, the first grafting of the Centennial variety for the purpose of selling the trees was done by William Nelson in 1882 in the nursery of Richard Frotscher, of New Orleans, and these nursery trees were first catalogued by Mr. Frotscher in 1885. Data subsequently obtained by the present writer showed that the variety was planted widely, in some cases on a large scale, between that time and about 1905 when its propagation practically ceased because of its pronounced habit of light bearing and the development of other more fruitful kinds.

An enlargement of the picture taken by Taylor was made in 1913 and hung on his office wall soon after he became Bureau Chief. It remained there until his retirement in January 1934. A copy of the picture made from his original negative is shown in Figure 1. On Pearl Harbor Day, December 7, 1941, or 39 years and 2 months after Taylor's visit, the writer visited Oak Alley Plantation and took several photographs. One of these, shown in Figure 2, is believed to be the same as the one photographed by Taylor.

It is of interest that the plantation

C. A. Reed

The Centennial Pecan

C. A. Reed

It is to this avenue of 28 giant live oaks, 14 on a side, that Oak Alley Plantation owes its name. These trees, together with the presence nearby of two of the first pecan trees ever grafted, give the place unusual historical interest and charm.

made notable by its pecan trees owes its name to a magnificent avenue of 28 live oak trees, 14 on a side, that beautify the walk leading from the mansion to the highway and the Mississippi River levee directly in front. While there is no exact record as to when these trees were planted, it is assumed by Mr. S. Stewart, who lives on the plantation and operates its 2,000 acres of sugar cane land, that they are now about 118 years old, as the mansion was built between 1830 and 1835, and it is reasonable to suppose that the avenue dates from about the same time. A view of the avenue is shown above.

ROCK GARDEN NOTES

ROBERT C. MONCURE, *Editor*

An Alpine Columbine

Aquilegia pubescens is one of those plants to be found only in well-favored places, remote and majestic places where huge gorges separate tall mountains and glaciers have piled up moraines of granite chunks; where the prospect transmits exultation, for its relentlessness is tempered by the gentle beauty of delicate flowers. Contrasts are strong — there is magnitude and finiteness and the elements show themselves indulgent and kind or savagely cruel. Tiny plants come out of the cracks in immense boulders, rosy finches, themselves wee specks on vast snowbanks, peck about for minute seeds, and out of a jagged groundwork of rocks in Bloody Canyon, *Aquilegia pubescens* makes a dainty fringe of pastel colors above its fernlike thread of small, pale gray leaves.

The flowers are large. They may be pure white or cream, pale pink or pale blue, light yellow or light lavender. There is often a hint of columbine red at the bases of the long spurs and the buds are sometimes flushed with a wine-red which disappears as the flowers unfold, remaining inconspicuous on the sepal reverses. This alpine aquilegia carries all the shades of the modern hybrid garden columbine and there is quite as much variety in the coloring. At 12,000 feet altitude, alongside *Polemonium confertum*, it is only a few inches tall. At 9,000 feet, which is about as far down as it comes, the flower stalk may be a foot long.

It looks just what it is—a wild plant satisfied and serene in its chosen place. I'm not sure that I should like to see it grown in the garden along with formal bedding plants and I doubt that it would be happy there. (Please don't write to me for seed for though I have plenty, it must by now be quite infertile, for gas rationing has clipped my wings.) It is impossible to transplant even very young specimens of this columbine for the long roots are securely anchored in the cool moist humus and gravel which have lodged in crevices between jumbled rocks. Sometimes it grows in almost pure stands; in other places its associates may be *Primula suffrutescens* or *Erigeron algidus;* and along rocky margins of alpine lakes it may join forces with *Cassiope mertensiana* and artemisias. It is found with drabas and with *Erysimum perenne* and, in the southern end of its rather limited Sierran area, with *Leptodactylon Nuttallii.*

Deer, the curse of the seed collector, are so fond of the crisp half-ripe seed pods that mature seed is difficult to bag. But even though one comes away seedless, the contemplation of this columbine and its choice companions is worth the long hard climb.

LESTER ROWNTREE,
Carmel, Calif.

Some Like It Cold

Scant sympathy is given the north slopes of our Rock Gardens since so many rock plants are sun lovers.

Yet in regions of much sunshine some of the high alpines and some that come from sunless climates, prefer a north slope and perhaps dappled shade. Too wet? A self respecting rock garden can't stay wet. Isn't it built on porous stuff?

It may be that we Rock Gardeners need a "credo" to keep us always reminded that the first Rock Gardens

Frasher's, Inc.

[*See page 216*]

Aquilegia pubescens

were made to simulate the lovely screes of the Alps in all their wealth of bloom; not, mind you, to imitate the appearance of rocks but to give these alpine plants the root conditions most nearly like those in their high home; porous drainage to carry off excess water, rocks to maintain equable temperature, and both to provide a cool root run, were first necessities. Then were added pockets of peatmoss or soil in the case of plants which ask for more food or less immediate dispersal of water.

Forty years ago, before the age of the geological-museum variety of rock garden or the sidewalk monstrosity, before people ever thought of making a Rock Garden because "nothing else will grow in that corner" precious plants themselves were the center of attention, love and care. We brought back these treasured plants from the Alps and our whole aim was to make them feel at home in the moist and muggy air of England—hence the rocks and scree. Those who begin at the end and work backwards may miss the whole thing. Haven't we seen great labor and expense spent on making a rock garden before there was a glimmer of imagination about the plants that were to make their home in it?

Pardon all this digression. We were attending to that bare north slope. In regions of much sunshine and perhaps of insufficient winter snow, here are some friends that will thank us for a north exposure: Snowdrops, Crocus, Chionodoxas, Miniature Daffodils, most of the Primulas, dwarf Trollius, Hepaticas, dwarf Mertensias, Boykinia, several Saxifragas, especially *S. austromontana*, in fact most plants that have retreated to the cold regions above timberline will prefer to face northwards even though they may tolerate a hot sunny place in their determination to hold on to life. Failure after failure hit me every time and everywhere I planted Aubretia until now there's a lovely green fleece of it, full of buds, two feet away from the north wall of a cement garage. Here the sun doesn't touch it all winter and in the summer only near the times of sunrise and sunset.

In this same rock garden sloping north at an average 45° angle are other things happy now after looking miserable in unkind places. *Primula marginata* loves it. *Aquilegia saximontana* grows into big clumps as gaily as on the high scree slopes of Pike's Peak. *Primula angustifolia* has lost the pinched look it had in a garden of half-day sun. *Phlox multiflora* becomes positively buxom. Last and loveliest, *Calypso bulbosa* is spreading its distinctive leaves flat over a little larger space each year, its little pink slippers looking so poised and ready for the fairies. Next, Fantasia-in-the-making we must show them to Messers. Disney and Stokowski.

Cement wall? Yes, that's bad, but *Euonymus kewensis* and *Euonymus radicans colorata* are doing their best with it.

After all, this country is so huge and affords such wide contrasts in gardening conditions — climate, soil, altitude—a north slope in my garden may be cool while in yours it's hot as blazes all summer. Wouldn't it be of real value if in telling how we grow this or that we would each give our maximum and minimum temperatures, altitudes, average days a year of sunshine, and average rainfall? Or at least say whether the scene of the crime is in Kentucky, Kansas or Kodiak.

For a gulp of our own medicine, above growing pains are experienced on the east slope of the Rockies in Colorado, 6,000 ft. elevation, high summer temperature 95°, low winter—25°,

Kathleen Marriage

Phlox multiflora
Primula angustifolia

humidity 25, rainfall 13 inches, sunshine 360 days.

In the South Rock Garden there are plants which love to cook in the sun, but that's another story.

KATHLEEN MARRIAGE,
Colorado Springs, Colo.

A Choice Little Cactus

Not all cactus, even of the smaller varieties, are suitable for the rock garden; however, that is a treasure in the Kansas plains that is a treasure in the high, dry section of even the most exclusive rock garden. (*Mammillaria* sp.)

The start is a tiny grey cushion, often not more than a half inch across. The result is a mound sometimes a foot high and two through, of these wee individuals so tightly compressed they look like one solid mass. This mound, at all stages of its development, comes down snugly on the ground or the rock, against which it may be growing.

Completely covering the mounds are the wealth of lovely amber flowers, which shade to a deeper tone in the throat. This display lasts a satisfying length of time, for the blooms open and close and open again for days, before falling to make way for newer buds. The tiny button of a cactus starts right in at its blooming job as soon as it decides it is happy in its location. We had tucked a single plant into a small hole in a rock along one of the walk borders and forgot it. I had even moved the rock without noticing it. Then this summer we saw some amber blooms apparently coming directly from a rock. Looking closer, there was the little cactus-button that had increased to three and was crowded with bloom.

The berries that follow are bright scarlet, about the size of coffee berries, and stand on end in the hollows under the flat-lying, lacy white thorns. These glow all winter, lasting until next season's flower buds push them out. A fine mound of this cactus is a treasure in the winter garden, making a lovely picture when the garden is covered with snow, as it melts about them quicker, leaving them very prominent in their white bed. The grey mound studded with scarlet berries, overlaid with lacy white thorns. Who could ask for a lovelier thing?

One mound in our rock garden measures ten inches tall, by fourteen broad; and has conformed to the shape of the rock beside which it is growing. All other edges fit down tight to the ground. I have no idea of the number of individuals in this plant nor its age, for it was a good size when we found it. Judging by the slow growth of the young plants it must be a patriarch. Another large one is doing its increasing more on the horizontal, but still rising several inches.

Their only requirements here seem to be a sweet soil, sun and perfect drainage. I accomplished this by adding lime to the soil and excavating a shallow hole which I filled with rocks about the size of my fist, and piled the earth on top, making a little knoll, on which I set the grey mounds and smaller ones of the colony. They have made themselves right at home and are doing as well as on their native prairie.

ALBERTA MAGERS,
Mountain Home, Ark.

A Northland Beauty

The Arctic Bellflower is no illusion! Its flowers really are that large. And its color is truly a clear, light lavender-blue. So my thoughts ran as I saw *Campanula lasiocarpa* for the first time. I had read about this northland beauty growing in the Canadian Rockies but had hardly expected to find it as far south as Shovel Pass in Jasper National Park, Alberta.

Kathleen Marriage [*See page 218*]

Calypso bulbosa

Warren C. Wilson

The Arctic Bellflower, Campanula lasiocarpa.

The plants grew by the hundreds in the Arctic-alpine Zone. Although "rugged individualists," their huge bells scattered over the grassy slopes and in the rocks made a striking display. Each flower was fully an inch and a half long. The stem was an inch in length and the rosettes of shiny, toothed leaves a half inch in height. A silver dollar could have covered a whole plant!

The range and history of the Arctic Bellflower are interesting. It now occurs in western North America, chiefly Alaska, and northeastern Asia. According to an eminent plant historian, this species probably occupied large areas of northern North America from coast to coast before the last great glaciation. During the glacial period all the plants were exterminated except those finding refuge in relatively small areas in Alaska and eastern Asia free from the ice sheet. The vigor of the species was greatly reduced by its long struggle for existence during this period. Hence, after the retreat of the ice, it has spread over only a small portion of its former domain.

Those of you with rock gardens are probably wondering why *Campanula lasiocarpa* is not common in cultivation. Unfortunately, it is very difficult to grow. Some English and Japanese catalogues list it and occasionally an American nursery offers it. Apparently Asia was the original source of these plants. They are less desirable than the plants I have described because of

their smaller flowers and longer stems. This may be the reaction of this alpine to cultivation at low elevations; it is typical of many. If you try to grow the Arctic Bellflower, I suggest a rather heavy soil (neutral in reaction) with some stone chips and peat moss added and a protected situation, to the north or east of a large rock or in light shade. Its natural habitat indicates these requirements.

WARREN C. WILSON.

RHODODENDRON NOTES

CLEMENT GRAY BOWERS, *Editor*

Rhododendrons in Kansas

In spite of the accepted idea that rhododendrons, azaleas, kalmia and associated plants cannot be grown successfully in the mid-west, the writer has not found them difficult garden subjects. The generally recommended method of planting—digging a hole twice the size of the ball, placing the plant therein and filling the remaining space with a peat soil mixture—is not at all satisfactory. No matter how much care is taken, the roots never seem to leave the root ball and the plants usually dwindle and die within a year after they are planted.

The following system has worked very, very satisfactorily here in eastern Kansas. The soil on the site is excavated to a depth of 15", and the excavation is filled with sawdust to a level 8" higher than the surrounding soil level. Oak sawdust is much to be preferred but if it is not available, soft wood sawdust may be used though it is advisable to acidify the sawdust in that case with a light coating of sulphur. Beds are best made in the fall before the planting is to be made so that the beds may settle and the sawdust start decomposing during the winter. This is not absolutely necessary, however.

Balled plants are not planted in this mixture as received. Instead the balls are held in holes excavated in the beds at about the right level, then the balled soil is washed off the roots while at the same time sawdust mixture is pressed lightly around the exposed roots. Plants are not set back by this drastic treatment; frequently late planted rhododendrons will show growth within ten days after being handled as above. Here, at least, a proper soil mixture is by far the most important factor in the successful growth of these plants.

About March 1st, when the first signs of growth appear in the spring, a light dose of fertilizer is given these plants, with a final heavy application not later than June 1st. Two foot plants are given about a pound with larger or smaller plants given greater or lesser amounts in proportion. The fertilizer used is made up as follows; cottonseed meal 5 parts, sulphur 1 part, 40% superphosphate 5 parts, ammonium sulphate 2 parts, potassium phosphate 4 parts. Plants are mulched with about an inch of sawdust every fall, and a light fence made up of corn stalks fastened together with wire is placed on the north side of the plants to lessen the effects of north winds.

Part of the rhododendrons are planted north of a house, the rest in a lath house. The azaleas are planted on the east side of a house or out in the open with no shade whatsoever. These rhododendrons have endured extremes of from minus 16 degrees, the second lowest temperature ever recorded here,

to a high of slightly in excess of 100 degrees, with no injury from summer sun but slight bud injury to a few from these low temperatures. Twelve different varieties of hybrid rhododendrons are included in these plantings and twenty-eight different varieties of azaleas, with a total of about 250 plants.

All of these plants are thriving—not merely existing, and I am convinced that the area in which they could be grown would be extended considerably if these suggestions with reference to soil preparation were followed.

The same suggestions apply to kalmia, leucothoe and vaccinum, all of which are doing well with me planted in the same soil. Very occasional waterings are given the plantings, though I make an effort to give them a heavy watering after the first hard fall freeze. This soil mixture absorbs an enormous amount of moisture, no rain water runs off the beds and it is rarely necessary to water the plants more than once or twice during the summer.

HARRY V. SEEVERS,
Ottawa, Kans.

Rhododendron mucronatum f. *sekidera* Wils. and Its Kin. (See page 225)

Under this very formidable name one must look for a very pleasant garden shrub that should be much more commonly planted than it is. This is the form of the familiar large white-flowered azalea that is often found in catalogues under the names of *Azalea indica alba* and/or *A. ledifolia.* In the case of the plant illustrated one must add the word *magnifica* to the above. At times it appears in trade under the name of Damask Rose.

If one consults Rehder and Wilson's "The Azaleas of the World" page 72, he will find other names that have undoubtedly appeared in the trade and see the reason for the adoption of this particular name for use in the botanical world. One will also learn by implication that there are several clones of this plant in cultivation not all of equal value. Of those seen by the writer, the only or chief variation appeared to be in the deepness of the rose red in the blotch on the upper lobes. Quoting from Wilson (l.c.): "the flowers are as large as those of the f. *Noordtianum,* pure white with the dorsal lobes spotted and splashed with rose, occasionally a flower is rose colored; the stamens vary from 6 to 10 but are usually 10." What Dr. Wilson did not mention is that sometimes this plant also throws parti-colored or even striped flowers, a factor which may have some historical value in considering some of the sources of varigated flowers in the past.

It is unfortunate that the same enthusiasm which has attended the rapid propagation and dispersal of the Kurume azaleas and has brought them even to ten-cent store sales within the last few years, has not come as far as this plant and the other cultivated clones that belong to the species. The probable reason is that a Kurume cutting forms a small flowering bush much more quickly than this, since there is no difficulty in rooting cuttings of this particular plant, nor the type. As always in this group, cutting should be taken from wood of the current year's growth, as soon as this is half ripe; that is, neither brittle enough to snap, nor soft enough to bend like rubber. Cuttings in both these extreme conditions can be made to root, but in the first case the process is slow and in the second tedious, since one must give constant attention to prevent wilting.

The plant grows almost exactly like white flowered type but occasionally is or seems a little more open in its growth. Like the white type it sheds part of its foliage in the winter so that in the latitude of Washington, D. C.,

Robert L. Taylor [*See page 224*]

Rhododendron mucronatum f. sekidera ¾ natural size.

Robert L. Taylor

[*See page 227*]

A Simsii × mucronatum hybrid.

it is only semi-evergreen. Growth starts quickly in the Spring but does not obscure the flowering.

The only cultivated plants which the writer has seen, which would appear to come under Wilson's *R. mucronatum* f. *amethystinum* if one may depend upon the color description, are not intermediate save in coloring; all have much smaller flowers and the corolla lobes are so much narrower than the others that the flowers appear starry. In the local gardens this form flowers two weeks ahead of the others.

No description is given for the plant grown in nurseries here as *lilacina* which is the pale pinkish lilac counterpart of the type. Whether this is a clone developed from the sporting branches of the subject of this note or is derived from some other source is not known. The only plants which the writer has seen, supposedly *R. mucronatum* var. *ripense* Wils., were raised from seed and obviously were not true since they exhibited a wide range of color including degrees of rose and pink which were too far removed from the lavender pink tone of the usual variations. They were definitely tender in the same climate. This is regrettable since they were lovely flowers of astonishing size. It may be noted that Wilson (l.c. page 73) says "I have examined the type of Makino's *R. ripense* and can find no character by which it differs from *R. mucronatum* G. Don except in the rose-purple color of its flowers, and *as is well known a branch bearing colored flowers is often found in Don's species.* (Italics mine, Aut.) Many hundred plants of the white-flowered type have passed through the writer's hands, but doubtless from not more than four clones, but never has a single flower been noted that was not entirely white.

It may easily be that much more work should be done with this group of plants not only in the raising of hybrids but the raising of seedlings from selfed flowers.

The writer has used it in various crosses, one of the earliest of which was with pollen of the white form on *Kampferi*. The results were a series of plants much like *Kampferi* in general growth habits but with larger flowers not one of which exhibited the least suggestion of *Kampferi* color save at the very base of the corolla where a faint stain of salmony orange showed above the lilac pinks. None has been saved. In crosses with *Simsii* varieties some very charming garden plants have resulted, one of which is shown, and it seems not impossible that with some care in the program, one might evolve a race of "Indian azaleas" using that term in the old loose sense, which would be useful at least in the Middle Atlantic States if not in either North or South. B. Y. M.

LILY NOTES

GEORGE L. SLATE, *Editor*

Minor Species of Asiatic Lilies

Eastern Asia and the adjacent islands are regions of great interest to the cultivators of lilies, for here are found more than half of the known species of Lilium. China and Japan are the headquarters of the genus, but in India, Burma and northeastern Asia several species are indigenous. *L. dauricum* is found as far north as 55° N latitude in Kamchatka while far to the south at 11° N latitude in the Nilgiri hills of southern India is found *L. neilgherrense,* separated from other lilies by the hot dry plains of central India. No other region of the world is so well-endowed with lilies.

The numbers, the beauty and the potentialities as garden plants of the Asiatic lilies inspired E. H. Wilson to monograph them in "The Lilies of Eastern Asia." Forty-seven species and many varieties were described. In the hands of hybridizers these species are producing many handsome new varieties, some of which excel their parents in beauty. New colors, new forms and greater adaptibility to garden conditions may be found in the hybrids raised in recent years.

The Asiatic lilies are generally a handsome lot. *L. auratum, speciosum, regale, Sargentiae, myriophyllum, Brownii, colchesteri* and *formosanum* are among the most beautiful, but many others would rate an honored position in any garden. Several are well-known and popular garden plants and may be found in the catalogs of many firms. Many do well in gardens and only a few are difficult. Except for the lilies of southern Asia most species are hardy, although in some cases it may be difficult to determine the true winter hardiness of a species since its disappearance over winter may well be due to basal rot rather than low temperature.

Many hybrids have been produced between the different species and in several cases the parents are rather diverse. Hybrids with the European and American lilies are few and only two are of importance. The upright-flowered descendants of *L. concolor* and *L. dauricum* have been crossed with *L. philadelphicum andinum* and several varieties from this line of breeding are now in the trade. *L. Hansonii* and *L. Martagon* have been crossed with excellent results and their progeny of the first and second generations are now growing in gardens.

This discussion is concerned chiefly with the lesser known species and variants of the more important species. At one time or another nearly all of the available species have been tried except the tender species from India which are poor travellers and arrive in very poor condition. With some experience is rather meager, with others considerable experience in propagation and breeding has been obtained.

The section Cardiocrinum consists of *L. giganteum, L. cordatum* (*cordifolium*) and *L. cathayanum,* all similar, and so different from other lilies that one not familiar with the genus is surprised to learn that they are lilies. The most striking characteristics are the large broad heart-shaped long-stemmed leaves. The flowers are funnel-shaped and horizontal. The plants take several years to reach flowering age, bloom once, bear a heavy crop of seeds and then die, leaving behind a few bulblets on the base of the stem to perpetu-

ate the plant. It is rather surprising to dig up the plant in the fall after the seed crop is ripe and find that the old bulb has vanished completely.

L. giganteum is well-known to lily fanciers in England where it is not regarded as difficult and many excellent specimens have been grown. In this country it is rarely seen. Only one plant has flowered and this attained a height of five feet. Another bulb planted at the same time failed to flower. Offsets from the flowering bulb have grown on, but are not especially happy, presumably owing to a lack of suitable shade and the competition of a large tree nearby. Apparently much more water is necessary than was applied. The plants are mulched with sawdust with additional straw for the winter. No plants have died over winter, indicating that the species is probably winter hardy under conditions obtaining at Geneva, N. Y. Several lots of seed have been planted, but very few have grown and less than a dozen seedlings have reached the flowering stage. Suitable conditions for this lily include a lime-free rather sandy soil well-filled with leaf mold. The shade of tall trees far enough away to eliminate root competion, a mulch of peat and plenty of moisture in dry seasons would complete the specifications.

A single specimen not well-grown is not handsome, but a colony of several plants eight to ten feet in height would be a worth-while addition to any garden. The flowers are seven or eight inches long, ten or more in number, white tinged with green on the outside, and white striped and splashed with reddish purple within. The large stem is hollow and clothed with large, glossy green broadly ovate leaves which form a rosette at the base with the stem leaves alternate and scattered.

L. giganteum is a native of the Himalayan region from Garhwol to Sikkim and in Nepal in the Khasia hills where it grows in the shade in very moist loam well-supplied with leaf mold.

To flower well it must be well-established for a year or two. The smaller sized bulbs should be planted to grow on to flower a year or two later. Shallow planting with the top of the bulb just below the level of the soil is advised. This necessitates thorough mulching during the growing season and winter, and free use of the hose if the weather is at all dry. Chemical fertilizers have been used with no sign of injury and possibly with benefit.

L. cordatum is a poor relative of *L. giganteum* and is not worth growing except as a curiosity. Two or three seedlings have been raised to flowering size which stage is reached sooner than with *L. giganteum.* It grows about five feet high and bears six or more creamy white narrow funnel-shaped flowers splashed with reddish purple on the inside. Presumably its cultural requirements are similar to *L. giganteum.* The plants have had cheesecloth shade, a loam soil to which peat was added, and a thick mulch of sawdust. Commercial fertilizer has been used, but no watering has been done. The species is found in Japan where it grows in cool moist situations in soils rich in organic matter.

L. cathayanum is no prettier than *L. cordatum,* but seedlings, of which two or three dozen have been grown, reach flowering size a year or two sooner. It has grown freely under the same cultural conditions provided for *L. cordatum.* The seedlings vary considerably in vigor and the color of the foliage in the spring. The color of the leaves varies from reddish to greenish and during the period of rapid growth in the spring the plants are attractive. The flowers are narrowly funnel-

shaped, greenish white outside and splashed with reddish brown on the inside. Visitors always pause and exclaim when passing this species, but one would scarcely care to grow it for this purpose alone since it is lacking in ornamental value. Thus far the plants have been winter hardy and apparently not difficult to grow.

L. cathayanum is a native of central and eastern China being found in dense woods along the banks of mountain streams.

The Leucolirion section of the genus includes the lilies with trumpet or funnel-shaped flowers. Some of the handsomest and most striking lily species belong here. *L. regale, formosanum* and *longiflorum* are too well-known to be included here.

L. philippinense, a native of the islands whose name it bears, grows wild in the mountains of northern Luzon in rocky places in poor light soils among trees, shrubs and herbaceous plants. It is rare in cultivation in the United States, no doubt because of its tropical nature. Plants which were raised from seeds procured from the Philippines have been grown in 12-inch pots which are kept in the cloth house in the summer and in the fruit cellar in the winter. Several plants in the garden survived one winter under a thick mulch of straw, but died of basal rot the following season so no further test of hardiness was made.

The special feature of this lily is the unusually long tubular flower which grows from seven to ten inches in length and is pure white with a delicate perfume. The plants grow from one to three feet in height and are clothed with grasslike foliage. The bulbs do not all flower at once but continue to send up flowering stems at intervals during the summer. This lily resembles Price's variety of *L. formosanum* and should not be confused with *L. formosanum* which was formerly called *L. philippinense formosanum. L. formosanum* was separated from *L. philippinense* in 1930 and accorded specific rank. Gardeners who want a dwarf lily of this type will probably be better pleased with *L. formosanum* "Price's variety."

Price's variety of *L. formosanum* is an attractive pure white lily with a long slender trumpet. The plants do not grow over eighteen inches and bear from one to five flowers. It flowers soon after *L. regale,* is hardy at Geneva, and is easily raised from seeds, the seedlings blooming the second or third year. This form was discovered on Mt. Morrison in Formosa in 1912. It is an attractive lily will worth a place in the border. Its low stature is an asset in a genus containing so many tall species. It is not particular as to soils and thrives in the full sun.

The Easter lily, *L. longiflorum,* as a pot plant is probably the best known of all lilies, but as a garden subject it is grown so little that it deserves mention here. Its merits as a garden plant have been overlooked chiefly because of a supposed lack of winter hardiness. It is likely that mosaic, rather than a lack of hardiness, has given the species an undeserved bad reputation in the garden. Two generations of seedlings have been raised and none have succumbed to the cold. Seedlings vary considerably in floriferousness and it is worth while to raise enough to permit selection of the better plants. These may be increased by detaching the bulblets from the base of the stem in the late fall and planting them out. A winter mulch of straw is advisable.

L. Brownii var. *colchesteri* is a variable and handsome Chinese lily that appears worthy of considerable attention from lily cultivators. At its best it is handsome trumpet lily that promises to fill the gap between *L. myrio-*

H. B. Tuttle

Lilium cathayanum

phyllum and *L. formosanum*. In a lot of seedlings raised from seed collected in China were plants that came into bloom from the end of July until late August, the later plants remaining in bloom until near the end of September. Vegetative propagation of the better plants would provide a series of August blooming lilies. The flowers are white within and of two general types, those with the external color of the perianth segments mahogany red, and those with the flowers creamy yellow in color as they open, but soon fading to white. The more attractive plants bore from three to five flowers that flared open nicely, but with some the flowers are rather narrow trumpets and less attractive.

Unfortunately this handsome species

appears rather susceptible to the three most serious lily diseases. The plants take mosaic readily, are susceptible to basal rot and under favorable conditions considerable damage is done to the foliage and flowers by botrytis blight. Spraying with Bordeaux mixture is advisable to control botrytis. In the shade of a cheesecloth house the plants grew six feet high and tipped over easily, necessitating staking. plants were very chlorotic on a clay loam soil containing lime.

Propagation is by seeds or scales, few if any bulblets being produced. The seedlings do not appear until the second season and grow rather slowly.

Observation thus far seems to indicate that a lime-free soil and a sunny airy site will suit it. Most of the plants are doing well on a sandy loam. There is no indication that the species is not winter hardy at Geneva.

L. myriophyllum (*sulphureum*) is one of the tallest and handsomest lilies the writer has grown. The immense sulphur yellow turmpets atop seven or eight foot stems are a striking picture. So large are the flowers that staking is necessary or the plants will break down in the wind.

Its reputation for hardiness is doubtful, but bulbs have spent several winters in the open ground under a mulch with no losses and it may be hardier than has previously been thought. It grows well in a clay loam soil in a cheesecloth house. Bulbs of a lily as vigorous as *L. myriophyllum* may be planted rather deep, eight or ten inches. This is one of the last species to come up in the spring, the plants not appearing until well into June, but growing very rapidly thereafter.

Large, greenish bulbils are borne near the top of the stem and may be used for increase. Seeds do not set easily but if obtained germinate as readily as those of *L. regale*.

Still another handsome trumpet lily is *L. Sargentiae*. In the past mosaic was rather prevalent in stocks of this lily and its reputation was none too good. A few years ago seeds were received from two sources in China. The resulting seedlings have performed very well growing to seven feet in height and flowering freely. Younger plants with not over five flowers are more attractive than the older plants with many flowers which are somewhat smaller and more crowded than is desirable. The plants grow with great vigor even after several years. One plant dug this fall after four years in the garden had fifteen flowering stems all about five feet in height.

The flowers are pure white within, varying from rose purple to greenish without. Small greenish bulbils are borne and may be used for increase, in fact the ground beneath the old plants is often green with the foliage of the young bulbils the following year. Flowering is about two weeks later than *L. regale* and for this reason the species is most useful. Moreover it is a beautiful lily and is possibly better adapted to a wider range of soils. This species has performed considerably better than *L. regale* on a light soil.

L. Sargentiae is very susceptible to mosaic and moderately susceptible to botrytis. No trouble with basal rot has been observed. Late spring frosts often injure the foliage which should be protected when frosts threaten.

It is as easily raised from seeds as *L. regale* and blooms in about the same time. One plant in a seed flat once bore three flowers the second year from seeds. Thorough mulching of seed flats and plantings of young bulbs is advisable for winter protection. In fact winter mulching of all the trumpet lilies should be routine.

L. rubellum is a very dainty and handsome dwarf lily flowering in early

H. B. Tuttle

Lilium tsingtauense

June. The rose pink flowers, one to four in number are borne on plants growing from one to two feet in height. It is native in the mountains of northern Hondo in Japan where it grows in light shade in a moist clay soil overlaid with a mat of leaf mold. It is not an easy species and numerous attempts to

bring seedlings to blooming size have all ended in failure. The bulblets die in the seed flats, presumably from basal rot. Collected with bulbs however have settled down in the cloth house in a clay loam soil for a stay of several years. Protected from mosaic and with luck as to basal rot one should not have too much difficulty in keeping it. It is a very pretty little lily well worth any efforts needed to grow it.

L. concolor is a dainty low growing small flowered species that provided a welcome relief in a genus with so many husky large flowered six-footers that dominate their corner of the garden. The brilliant red of *L. concolor* soon catches the eye, but it is by no means overwhelming. The plants grow from one to two feet in height and the slender stems bear solitary erect flowers. Some plants make dense clumps of many stems necessitating occasional division to prevent crowding. It seeds freely and is quickly raised from seeds. Rabbits are very fond of the foliage and in one planting they have been so persistent that the plants were soon killed out from overgrazing by these "undelightful" creatures. *L. concolor* is happy in any good soil, prefers the sun and is not troubled much by disease.

L. concolor var. *pulchellum* is taller and bears several flowers. It flowers in mid-June.

A yellow flowered variety is *coridion*. The only plants tried had mosaic and did not perform well. By pollinating this variety with var. *pulchellum* seedlings were raised but all were red-flowered. The second generation contained several yellow-flowered plants all less than a foot in height. These are small enough in stature and flower to have possibilities as rock garden plants.

L. tsingtauense is apparently a rare lily in cultivation and the few with knowledge of this species consider it difficult. Raised from seed at Geneva it has performed well on a clay loam soil under cloth and on a sandy knoll in the full sun. In the sun, however, the flowers tend to bleach in hot weather. The flowers which appear in mid-June are sometimes asymmetrical and are brilliant orange with a few fine spots. On well-established plants the flowers vary from one to eleven in number. The plants grow from eighteen inches to two feet in height and bear the foliage mostly in one large whorl with a few scattered leaves. In the spring the leaves have a characteristic mottling which is suggestive of one of the trilliums. In a limestone soil some chlorosis is evident. The seed capsules are strongly winged.

The seedlings come up the second spring and grow rather slowly. Bulblets have been seen on only one stem and are evidently very rare. So far the bulbs have not divided. Scale propagation has not been tried, but seedlings are not difficult although rather slow.

L. tsingtauense is an attractive and worthwhile lily well worthy of a place in the garden, but bulbs are scarce and may be difficult to obtain. It is indigenous in the province of Shantung in China and southward from the Diamond Mountains in Korea where it grows in moist shady situations.

L. Duchartrei is an unusually dainty and attractive lily that cannot fail to appeal to all who see it. The small pendulous Martagon type flowers are not bold and striking, but are exceptionally beautiful and if several plants are grown in a colony the effect is very attractive. The flowers are marble white with fine wine purple spots and striations and are fragrant. The stems grow to three feet in height bearing from one to twelve flowers in early July. Numerous bullets are formed

H. B. Tuttle

Lilium medeoloides

along the wandering stem which may travel a foot or more from the bulb before pushing up through the soil. The careless use of a hoe before the plants are up can cause considerable damage to these stems. Hand weeding is advisable while the plants are starting in the spring.

Seedlings come up the second season and grow rather slowly, but are well worth waiting for. The numerous bulblets along the wandering underground stem may be used for increase.

L. Duchartrei is a native of western China in the high mountains of northwestern Yunnan, Szechwan and southwestern Kansu where it grows along the margins of forests in glacial grit with black humus.

L. Leichtlinii is a very scarce and beautiful lily and apparently is infected with mosaic which makes it of little value to anyone except the breeder. If vigorous, virus-free plants could be had this species would easily be one of the handsomest of the yellow lilies. The flowers are of the Martagon type, up to five in number citron yellow in color and bloom with *L. tigrinum.*

L. Leichtlinii var. *Maximowiczii* is the orange red form of this species and is as easy to grow as *L. tigrinum* which it resembles except that there are no bulbils. Easily raised from seeds it varies greatly in time of bloom with some plants flowering in late September. It is of easy culture, but is no improvement on *L. tigrinum* unless late blooming seedlings for autumn flowering are selected.

L. Henryi is a sturdy, vigorous plant too well-known to gardeners to be included here, but some worthwhile variants have appeared. *L. Henryi* itself usually has a weak stem that requires support and the flowers are of a shade of orange that is almost too common in the genus. An attractive yellow flowered form, *L. Henryi* var. *citrinum,* possesses the vigor of the parent species as well as the lax stem. It increases well from stem bulblets which are more numerous from heeled in stems. Still another color variant is *L. Henryi* var. Buttercup received from Japan as a yellow *Henryi.* It is less yellow than *citrinum* and some seasons the color suggests that of a faded *Henryi.* Under the name of *L. Henryi* Improved an upright form is being offered with a stem rigid enough to stand up without support. This is a good form of a good lily and is decidedly superior to the general run of *L. Henryi* seedlings. The hybridizer who combines the stiff stem of this variety with the yellow flower of *citrinum* will have made a worthwhile contribution to lily improvement.

L. amabile, another well-known orange red lily has given rise to a very handsome yellow form known as *L. amabile luteum.* It is as easily raised from seeds as the type and all the seedlings are yellow flowered if the seed and pollen are both yellow. It is much prettier than *L. amabile* and deserves a place in any garden. It offers no cultural difficultures and is not particular as to soil.

L. cernuum is a dainty small flowered species with grass like foliage and habit that suggests *L. pumilum.* The flowers are rosy lilac, an unusual color in lilies, and pendulous. If it were more vigorous and persistent in gardens it would be a worthwhile addition to a lily collection.

L. Red Star is a low growing lily that seems to have appeared in cultivation without anything very definite being known as to its origin. The foliage is that of *L. pumilum,* the flowers are brick red, face to the side and are asymmetrical with reflexed segments. Some think it is attractive.

L. callosum is of interest chiefly be-

cause it flowers in late July when lilies are scarce. The flowers are brick red in color, pendulous with tightly reflexed segments and are possibly the smallest of any lily. The plants grow up to five feet in height, are slender with short narrow leaves and bear from five to twenty flowers. A colony is not unattractive and the collector of lilies will find it an interesting plant to talk about as the lily season wanes. The general gardener, however, can probably find plants that will make better use of the space than *L. callosum*.

It is easily raised from seeds and is troubled by little except rabbits which seem to be especially fond of it.

L. medeoloides is a modest little lily that grows in Japan, Chekiang, China, and Quelpaert Island off the coast of Korea. It is said to be highly esteemed by the Japanese, but although long cultivated in Japan, it is little grown in this country. Plants from imported bulbs grow to four feet under cloth in a heavy soil. Some have disappeared from causes not known, but seedlings appear to be doing well although they are slow in reaching the flowering stage. The foliage is concentrated in one or two whorls with a few scattered leaves above. Up to ten flowers similar to *L. amabile* in color are borne rather closely clustered near the top of a rather long stretch of nearly bare stems. *L. medeoloides* is interesting and attractive, but is not likely to become an important garden plant. The specialist will enjoy a few plants in a collection.

NARCISSUS NOTES

B. Y. Morrison, *Editor*

Texas

27th of February, every twig and branch covered with ice, and the following daffodils in full bloom! Alroi, Cocarde, Brunswick, Royalist, Orange Cup, Carlton, Trevisky, Havelock, Pilgrimage, Yellow Poppy, Beersheba, Naxos, Niphetos, Fortune, Helios, Aleppo, Tregantle, Bodilly and Sulphur Prince.

Always there is February bloom—often much, but rarely has there been such a medley of ones, twos, threes and fours, at the same time.

A very dry warm autumn followed by rains in December and short periods of winter cold, with more or less continuous rains, may have induced a quick growth of scape and premature bud development, resulting in an unprecedented mass of simultaneous bloom, shorter of stem, smaller of flower, yet arrestingly beautiful, even those dirty of face, until washed clean by gentle rain which followed the ice.

Some choice varieties show no promising buds. Particularly disappointing in this respect is one planting of St. Egwin, which though down three years has never bloomed. One wonders why?

For spectacular garden display, Carlton never disappoints. Marmora in its creamy white loveliness is another that does not fail, and Adler growing near, coming a day or so later, is an example of perfect satisfaction, amongst the many.

Porthilly, three or four years out from Ireland, has shown its claimed brilliance only this season; perhaps a favorable response to cold and rains, in what may be for it, an otherwise unfriendly climate. Havelock, after many years, has also proven its rightful claims to beauty by improving in looks, from year to year.

The reader must remember that Texas gardens have not generally featured daffodils and comparatively, the performance of these mentioned, might be as nothing, to other gardens in a different climate.

I could go on naming the old, those not so old—some of the very new to this garden, with the performance of each, but, of the newest of which I read, and promise myself for a later trial, I have few. The latest additions to my collection, and those holding immediate interest, are Market Merry, Polindra, Carbineer, Diolite, China Clay, Lady Kesteven, Rustom Pasha, Jean Hood and Shirley Wyness. The last two are not promising for 1945 blooms. Of them all so far, Diolite stands at the top.

A Texas garden may not be the best spot for testing daffodils, because of the hot summers, but even so they are a grand beginning for the year's fun, although a by-the-day-man is almost non-existent.

Mrs. William H. Benners,
Dallas, Texas.

Maryland

It's a race between the species Cyclamineus and the hybrid Chicopee (Obvallaris × Cyclamineus) as to which will open first and usher in the daffodil season that usually lasts for 9 or 10 weeks until Recurvus and Albus Plenus Odoratus fade. In some years Chicopee comes out a day or two ahead; in others the reverse is true. Cyclamineus is a dainty little narcissus, hardy and reliable. I planted 10 bulbs 10 years ago at the foot of a north-sloping terrace where they compete with weeds and grass. There were 16 flowers this year. The pollen is potent and they seed very freely if hand pollinated. Both bloom from 10 days to 3 weeks earlier than February Gold, Alasnam, Whiteley Gem, Fortune, or King Alfred.

1945 will long be remembered as the most unsatisfactory blooming season "in the recollection of the oldest inhabitant." Midsummer temperatures that went above or hung around 80° F. for two weeks in March forced the daffodils so rapidly that they had not time to attain normal size, height, or color. The entire flowering schedule was upset and early, midseason, and late varieties were open at the same time. Few of the red cups were red; some were orange, others yellow. My seedlings were infinitely superior to most of the older varieties and many were really outstanding. The newly introduced Catskill, a bicolor Incomparabilis from Bokhara × Sunstar, was especially noticeable because of its large size, height, brilliant color, and abundance of bloom. The large flat-crowned Ontario from Robin Hood × Fortune has the rich copper color of the crown much like that of Copper Bowl or a glorified Fortune. It has the largest flattest crown that I have seen and it is not out of proportion to the white petals.

Only a few of the older varieties were normal in every way and produced an abundance of fine flowers that lasted well either cut or in the field. They included Alasnam, Beersheba, Daisy Schaffer, Forfar, Hades, Jean Hood, King Alfred, and Seraglio. The late blooming varieties were better in every way than those that opened early because they had the benefit of cooler weather to grow and open, but they were 2 or 3 weeks earlier than usual. The first Cyclamineus opened March 15, Chicopee March 17, Minor on the 20th, and Recurvus which usually closes up by May 10-15 was open on April 16. A few seedling Poets carried the season into the first week in May.

The longer I grow it and the more I

Robert L. Taylor [*See page 240*]

Narcissus, Truth

see of Beersheba the more I am convinced that it is the outstanding White Trumpet. During the last 23 years I have grown 30 varieties in this division of which I still have 8, not including my own productions. Beersheba is white, hardy, floriferous, and a good increaser. It is of satisfactory height but if the stem were 3 inches longer there would be no White Trumpet to compare with it as a commercial or exhibition flower. Mrs. Ernst H. Krelage, often called the white King Alfred, was introduced 11 years earlier, is taller and otherwise nearly as good but does not have a pure white trumpet.

Last year I got my greatest thrill from two red-cupped Jonquil hybrids the fourth year from seed. One was from Tredore, the other from Trevisky. They were lifted and lined out in August in a short row with other promising seedlings, and although they have grown vigorously they lacked the brilliant color in the cups that they had last year; it was orange like that of most of the red cups. If the red persists in normal seasons they will be worth watching.

The beneficial effect of light shade was very noticeable on a group of White Trumpets and Large-Crowned Leedsiis that were planted under an oriental cherry and shaded on the south by an Austrian pine and on the east and west by two Douglas firs about 20 feet tall. In the group were Carnlough, Naxos, Rosary, Suda, and several pink-crowned Leedsii seedlings. Carnlough opened with a beautiful pink-edged crown. Naxos was pure white. Rosary developed the "rich warm cream color distinctly suffused with faint rose or shell pink" that was breath-taking, the like of which I have never seen when it has been grown in full sun. Seedling 37/254 from Lovenest × Mrs. R. O. Backhouse produced several flowers of perfect form with bright shell pink crowns. The color was excellent when the flower opened in full sun in the seedling bed two years ago. The yellow Incomparabilis Penquite also developed fine color. All these varieties opened later than if they had been grown in full sun.

EDWIN C. POWELL,
Rockville, Md.

Narcissus, Truth (See page 239)

Quite properly in gardens one's whole attention should not be given over to the production of flowers for exhibition nor should one's entire affections be centered on the formal type of bloom. The fact remains, however, that once conscious of the special beauty of the formal flower, this seems more conspicuous each Spring.

This variety is a Giant Leedsii of Mr. Guy Wilson's raising and has been in commerce some years. Like many of its kin it blooms early in the season, coming here with the earliest yellow trumpets. It is vigorous and multiplies well though not with the wanton abandon of the smaller Leedsii varieties which soon become a problem to the grower on a small property. As can be imagined from the illustration, the flowers are a pure white with no hint of yellow, even on opening. The white, of course, is not the ultimate in white which one gets as yet only in the perianth of the true poets, but the whiteness makes a fine foil for some of the other early Leedsii varieties which are tinted with pale yellow or a hint of green.

The flowers from which the illustration was made were picked fully opened in the garden and had no benefit of opening under cover or in a place free from the vagaries of our Spring weather, which in this year, 1945, were many, giving us a dry precocious season which spoiled many an early colored cup and

left Fortune with only a small degree of the color that makes it so unusual in normal years.

When the time comes that one can pick a great bunch of it, as he can now do with many of the more familiar sorts, there will be a pleasure as yet unexperienced by most of us.

A Book or Two

The Fuchsia Book. Alfred Stettler, Editor. Published by the American Fuchsia Society, California Academy of Sciences, Golden Gate Park, San Francisco, Calif. 1944. 68 pages, illustrated. $1.00.

This is the first special publication of the American Fuchsia Society and takes the form of a yearbook with many articles, illustrations both in black and white and in color, and a check list of varieties introduced since 1934. This last is a supplement to the Check List published in 1934 under Dr. Essig's guidance. Our readers will recall Dr. Essig's excellent illustrated paper that appeared in the National Horticultural Magazine in January of that same year.

While the material presented is essentially from California, the book merits the attention of all gardeners, even those who cannot grow fuchsias for one reason or another, in order to appreciate the increasing diversity of form and beauty that may be found in this old-fashioned but lovely plant.

Garden Graphs. Paul R. Young, Garden Reviews, Inc., New York, N. Y. Distributed by Educational Publishing Corp., Darien, Connecticut. Price—Elementary, 30c; Advanced, 36c; Teacher's Manuals, 16c and 18c. Sample sets, 4 books, $1.00.

There are two of these booklets, each with its accompanying Teacher's Manual, Elementary Garden Graphs and Advanced Garden Graphs. They are planned for use in school gardens and particularly under present day Victory Garden conditions. The graphs are numerous, clear and simple, and could be read with profit by any beginning adult gardener, who might want to study the teacher's manual as well as the student's text. Everything is covered from the choice garden site and soil preparation, up to the final exhibit. Vegetables are the vital subject.

The Gardener's Pocketbook

Bignonia capreolata again

In the Magazine for April 1945 (p. 158) Mr. Robert M. Senior asks if this plant flowers north of the Ohio River.

I refer him to Deam's Flora of Indiana (p. 858) where he can see a map showing the distribution of the species in Indiana.

Yes, it flowers there and prolifically from Crawford County westward. It grows to large size in the Lower Wabash Bottoms and I have a flowering specimen from Madison, the county seat of Jefferson County. I have seen it in abundance on the ground, on the high, dry banks of the Ohio River but there it rarely climbs. Only in the very southwestern part of the State does it assume its climbing habit.

A specimen planted about 1925 in our front yard in Bluffton (Wells Co.) flowers freely each year and has for some ten years at least. Although the plant is evergreen in southern Indiana it becomes deciduous here. My vine, on a walnut tree, must be 30 to 40 feet high, perhaps more. I have also a younger vine in a Liquidambar tree that has not yet blossomed.

Mr. Senior does not mention the foetid odor of the plant.

I like the plant and would recommend it, but it must be old before it flowers.

A Subscriber.

Lycoris squamigera (See page 170)

Perhaps those who have had trouble in blooming *Lycoris squamigera* would have better success if they grew them in deciduous shade. They grow with us and bloom freely under beech trees where not even lily of the valley will grow and strangely will bloom under these conditions at least a week earlier than out in the open. The increase of bulbs is larger than in the bright sunshine.

Carl H. Krippendorf,
Cincinnati, Ohio.

The Black Haw (See page 243)

Among the many valuable members of the viburnum family, the Black Haw (*V. prunifolium*) has qualities which make it a very useful subject in all but the smallest yards. To begin with it thrives in a wide variety of soils and conditions, being rather more resistant to dryness than most viburnums. The plant is little subject to attacks of insects and disease. The foliage, while not as distinctive as in some species, is nevertheless attractive especially as it colors up in the fall. The broad, flat clusters of white or creamy-white flowers make it an object of interest, and the abundant production of oval, blue-black berries which follow, have long had a strong appeal to the small boy. Although the fruit is rather seedy, the pulp has a sweetish taste enjoyed by some. Considerable variation has been noted in the size of the fruits and in the amount and flavor of the pulp.

The very twiggy growth of this viburnum makes it an excellent choice for the tall hedge or screen. It takes kindly to trimming and makes a thick, dense barrier which might be used as a boundary planting or as a background for the herbaceous border.

The new shoots which are slender, flexible, and comparatively straight have been found useful for plant stakes. They may not last as long as the bamboo, but it has this advantage that the amateur gardener can "grow his own."

It is, perhaps, as a specimen small flowering tree that the Black Haw has its greatest possibilities. Trained to a

Robert L. Taylor [*See page 242*]

Viburnum prunifolium
Black Haw

single stem it can be expected to attain a height of 25 to 30 feet. A few years ago the writer saw a very fine specimen in a farm yard near Annapolis, Maryland. It stood about 25 feet high and had a trunk diameter of about a

foot. The tree was in full bloom at the time and it was literally covered with flowers. Any home owner could well have been proud to possess such an attractive object.

In our rush to acquire every new offering in the nursery catalog, we are prone to overlook some of the valuable plants near at hand. This comes about partly because we do not take the trouble to find out what some of the native types can do when given the same care and attention lavished on the highly advertised new comers.

W. R. BALLARD,
Hyattsville, Maryland.

Green Petunias

Bailey says, "There is no such thing as a pure green flower," and again, "green and yellow-green (which do not appear in the floral world)." My friend Henry Beeman of New Preston, Connecticut, has been a plant breeder for many years. He is now 87 and nearly blind. For several years he has been growing a petunia whose blossoms are of the same hue as the leaves. Deep in the throat is a little color but this is unnoticed unless one looks straight down inside the flower. In a bouquet the flowers are not conspicuous but the single petunia form sufficiently distinguishes them. A colored flower or two is desirable in the bouquet.

In the breeding the green color began as a border. Then by selection and hand pollination the complete flower was gradually developed. The type is not fixed, however. No green flower has been found with pollen. They have appeared each year from seeds that are now four years old. Mr. Beeman is now unable to continue his experiments. Can any one suggest a method of fixing this type?

DR. W. C. DEMING,
West Hartford, Conn.

Dianthus Knappii

By far the easiest of the Dianthus in this section is *D. Knappii*. Reportedly quite difficult to grow it was planted in full sun in a lean, sandy border which received very little watering in summer. There it has proved to be of easy culture.

A few of the original plants have died out, but it scatters its seeds with such abandon that seedlings come up as thick as weeds. Some of them may be found thirty feet away in the sand-clay soil of the parking which due to labor shortage has not yet been sodded. There they compete with a heterogeneous assemblage of weeds and have their tops cut off when the weeds are cut.

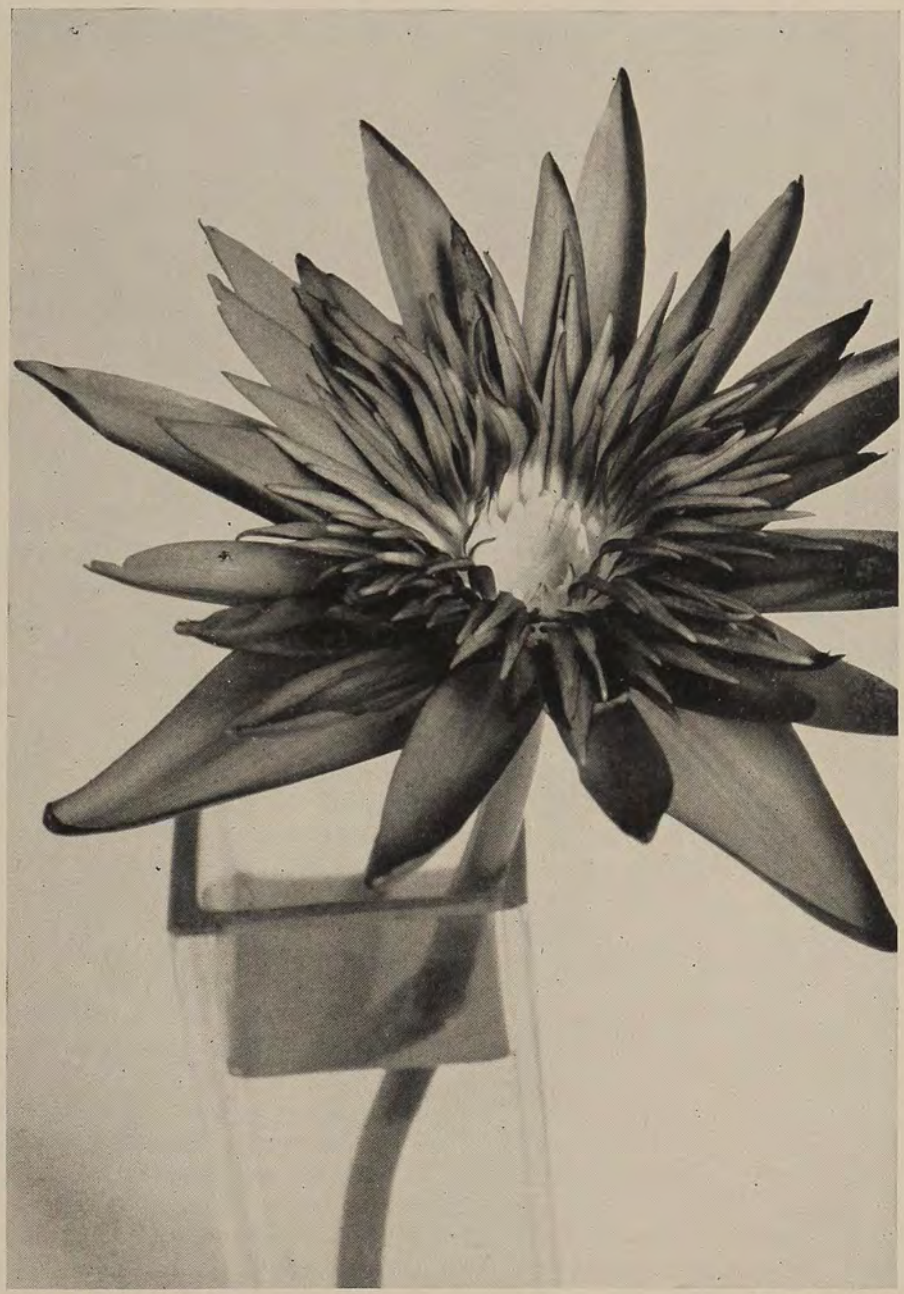
As it is tap-rooted it is quite difficut to transplant. It does not give a great wealth of spring bloom, but gives considerable bloom throughout the summer. The blossoms are not large enough to be startling yet their yellow color always causes comment.

ELEANOR HILL,
Tulsa, Okla.

Two Tropical Water Lilies (See frontispiece and page 245)

Although the variety Midnight has already been mentioned in the Gardener's Pocketbook (N.H.M.: July 1944) it is only now that we have a picture that can be added to the description given then. By permission we quote from Mr. Pring's own description taken from his excellent paper in the Missouri Botanical Garden Bulletin for March 1941, a paper that all lovers of tropical water lilies should own and heed.

"This is double-flowered, an absolutely new break in water-lilies. The flowers are small and dark violet but open widely very early in the day, unlike its parent variety "Jupiter." The flowers are fully double, all the stamens being replaced by petals which make a



Robert L. Taylor [*See page 244*]

Nymphea, Midnight

dark blue rosette in the center of the flower. . . . "Midnight" is another of the new hybrids with *N. colorata,* and, like all the varieties which have come from that species, it has numerous leaves and is very floriferous."

To this we should like to add in this issue a picture of the variety Peach

Maxcine Williams *Oplopanax horridum*

Blow which gave particular pleasure in the pool last summer (1944). The picture like that of Midnight is life size, from a flower grown under ordinary conditions and not treated to special feeding. It is probable that it does not do full justice to the bloom. Nevertheless, it is the color that is the special attraction in this case, a pale clear yellow over which from the tips of the petals downward there is a pale equally clear wash of Pale Amaranth Pink (Ridgway). The flower carries as a clear pink but on closer examination has the lively quality of color that one gets in some rose varieties in which pink is brightened by the yellow beneath the pink.

Although by personal preference, were the writer limited to a single variety he would undoubtedly chose one of the so-called blues, it is only fair to record that this lovely flower has a special charm that should endear it to many once it is known.

Oplopanax (Echinopanax) *horridum.*

Devil's Club (See page 246)

Those of us who were brought up to contrast in the class room the soft sound of sweet Camilla scouring the plain with Ajax' hard efforts in striving some rock's vast weight to throw, will feel that there is a real feeling of sound matching sense in the name of this plant. *Oplopanax* (or Echinopanax as it is called usually) *horridum* certainly suggests a fierce, hateful plant. Horridum, indeed! In the coast forests of Alaska and elsewhere, its great thorns bar the way to travelers. It makes almost impenetrable thickets, growing up to 12 feet in height, with strong, thorny stems. It is, nevertheless, a handsome plant.

The leaves are large, 6-24 inches long, petioled and bright green. They are roundish-heart-shaped, with 3-11 lobes, pinnatifid and irregularly toothed, hairy beneath, the nerves covered with prickles on both sides. The flow-

ers are greenish-white in a dense terminal paniculate umbel, calyx teeth indistinct, 5 petals, 5 stamens, alternate with the petals and about twice their length, styles 2. The fruit is berry-like, bright scarlet when ripe. The plant blooms in July and August and fruits in August and September.

It is a handsome shrub, attracting attention wherever it grows and receiving also execration from woodsmen or travelers who try to cut their way through its thorny stems.

Though the plant is commmonly known as *Echinopanax,* Hortus 2nd calls it *Oplopanax,* which is, perhaps, an earlier name, though that does seem entirely clear. It was first described, according to the Botanical Magazine, 140.f.8752 (1914), as Panax horrida, soon afterwards as Aralia erinacea. It was then placed in a distinct section, Oplopanax, of the genus Panax. It is now considered a monotypic genus. It is a member of the Aralia Family.

The Devil's Club is a native of the Coasts and islands of North-West America from Sitka and Queen Charlotte Sound to the borders of California and to the western side of the Rocky Mountain Divide. It occurs also in Japan, where it is known as Ari Bouki. Professor Sargent saw it growing in Japan in hemlock spruce forests, flourishing in deep shade.

Planted at Kew in England, it did not succeed very well because the milder climate started it into growth so early that this early foliage was almost always killed by late frosts. It likes a moist soil in partial or dense shade and may be propagated by seeds, suckers and perhaps root-cuttings. It is probably a case, with its thorns, of horrid is as horrid does for in spite of its beauty, it has never been a garden favorite.

Sarah V. Coombs,
New York.

More about Colchicums and Magnolias

A comment on the note on Colchicums by Carl H. Krippendorf in the January number. Another and equally ideal way to plant colchicums is to place them near the house under beds of periwinkle (*Vinca*). The coarse colchicum leaves as they ripen in early summer can be tucked down out of sight under the dark glossy periwinkle and in September when the bulbs send up their flowers the vinca forms a very good background and also holds up the flowers which otherwise would become mud splashed and broken in a heavy rain and would not last in beauty half so long. Every year or so after the vinca has grown thickly, give it a severe haircut in early spring, to keep it within bounds and this treatment also serves to make it bloom more profusely so one sees the vinca starred with its pale blue flowers, when the colchicum are raising their heavy quite majestic looking leaves.

The note from Takoma Park on magnolias self seeding interests me for here also they are seeding in a very obliging manner and I also tried potting them up, only to lose them through carelessness and now owing to complete neglect of lawn mowing beneath the big *Magnolia macrophylla,* two very fine and sturdy seedlings have been growing for the last few years for the great tall mother tree is dying. The magnificent cup-like waxy white flower with its long banana-like leaves will be greatly missed this June and it will be years before its descendent flowers. *Magnolia soulangeana* have appeared and died so last Autumn I put small wire fences around one of the larger ones so that it would not be tread upon by my absent minded self.

F. E. McIlvaine,
Downington, Pa.

Mascarena Vershaffeltii—An Unusual Palm

Of the very numerous species of palms grown in southern Florida, few are more unusual or peculiarly beautiful than the plant now known as *Mascarena Verschaffeltii*. It is now rather frequently seen in dooryards and parks in the vicinity of Miami, but it is strictly tropical in its requirements as far as temperature is concerned.

This palm was originally described in "L'Illustration Horticole" by Herman Wendland in 1866 under the name of *Hyophorbe Verschaffeltii*, by which title it is generally known today. The true genus Hyophorbe, however, is now limited to a pair of tall slender palms, unknown in cultivation in this country, from the Mascarene Islands. The palms generally known as Hyophorbe in southern Florida have been placed by the palm specialist, Dr. L. H. Bailey, in a new genus, to which he gives the name Mascarena.

This genus as now understood consists of three species from the Mascarene Islands, a small group in the Indian Ocean, approximately 400 miles east of the large island of Madagascar. Two of these palms, *M. lagenicaulis* and the present species, are cultivated in south Florida, but the third, *M. Revaughanii*, is apparently not yet grown here.

Mascarena Verschaffeltii is usually seen as a short stout palm with a scanty head of short recurved leaves and a rather prominent bulge below the green crown-shaft. The tree illustrated, however, is an old one many feet in height, thus showing that old mature plants of this species may be used as tall standard specimens. This plant of Mascarena is growing in the Fairchild Tropical Garden, near Coconut Grove, Florida, where many other rare and unusual palms and other trees may be found.

At the base of the crownshaft of the palm in the photograph may be seen three unopened flower spathes and two old inflorescences. The flower-clusters when fresh are of a pleasant yellow color, which, against the gray of the trunk and the green of the crownshaft, form a most striking combination. The fruits when ripe are black in color, about ½ inch long, oblong in shape, and rather shiny.

This palm is ideal for dooryard planting in southern Florida, since it is rather slow-growing and never attains a very large size. Its interesting form and neat appearance, combined with attractive yellow inflorescences, make *Mascarena Verschaffeltii* a palm which should be more widely grown in our southernmost state.

Alex D. Hawkes,
Coconut Grove, Fla.

From the Midwest Horticultural Society

Fagus sylvatica pendula

Last year a chance observation called my attention to one of the most desirable weeping trees. This observation was of an old specimen of the weeping beech. Apparently this plant had been in the garden for some twenty years or more, but had escaped my attention.

This plant has a straight stem from which the branches come out horizontally and then gracefully droop. The smooth gray bark of the tree caught my eye through the surrounding shrubbery which screened it from the street. The tree is about twenty feet high and somewhat one-sided from the shade of the elms lining the street. In studying this and other specimens of weeping beech I have been impressed by the desirability of these for accents in the large garden. While the willows are the best known of the weeping types of arborescent plants, the beech has a stiffness of the branches that gives a grace like that of the crinoline skirt compared to the wrapper.

Soil conditions and exposure would be the same for this variety as the species and other forms. Good loam with full exposure, or light shade, and a moderate moisture supply. The largest specimen of this species that I have seen was growing in central Ohio on one corner of a lot with a copper beech on the opposite side. The two had reached full maturity with trunks about three feet in diameter. The magnificence of these was breath-taking.

Eldred E. Green.

Prunus cerasifera pissardi

There are three good clones of purple-leaved plums on the market. There are some who claim a particular advantage to each, but as a nurseryman remarked the differences are so small as to be of no consequence from any practical standpoint. The purpose of these purple-leaved plums is to provide an accent in the shrub border. This spring has served to accentuate the color of all plants as the leafing out has been extended over a much longer period as cold wet weather has prevailed. Gardens with a plant of colored foliage have stood out from the surrounding sea of green. While height and texture accents are difficult on small properties these plums break the monotony in color and in height. They are low trees in stature and so are above the majority of shrubby material. While it is true that odd colors can be overdone in a garden, yet the judicious use of *Prunus pissardi* and its related purple-leaved plums can be increased in many gardens.

Culture is not difficult. A good garden soil, and an open exposure so the sun can fully develop the coloring are all that is necessary. While not particularly long-lived these plums are inexpensive and grow rapidly so that an occasional replacement may be made without undue loss in effectiveness or value.

Deutzia scabra plena

The deutzias are not too well known to most persons although rather generally listed. Probably most of them are passed off as some form of spiraea by most observers. Another point that may work against the plant is its supposed tenderness. While the plant is top tender to repeated low temperatures this injury occurs only in those exceptional winters when injury to many other plants is also widespread. So far as I have observed, injury has been apparent only once in a decade, and then only during the winter of 1940 when many plants suffered from the prolonged spell of sub-zero weather.

The variety Pride of Rochester is the most widely distributed of the deutzias. It is a medium, somewhat spreading shrub slightly larger than the bridal wreath and not so drooping. The leaves are a medium green with a grayish cast from the hairy covering. The flowers, which appear in late spring, are white or slightly tinted with pink on the outside and produced in small panicles. The flowers are double and the effect of thousands of little blossoms in clusters covering the plant is quite striking and showy. A plant in full bloom rivals the well-known effect of the bridal wreath.

The plant is not particular as to soil and may be grown in full sun or shade. In the latter situation it is not so compact or floriferous. Even if damaged during an exceptional winter the plant produces many strong shoots from the base and in two or three years has fully recovered.

This is an interesting addition to any shrub border.

Taxodium distichum

An interesting tree for the mid-west is a deciduous conifer, the bald cypress (*Taxodium distichum*). While properly known as bald cypress to distinguish it from the genus Cupressus, the true cypress of warm countries, popular usage is to refer to this as cypress, and the term is used to apply to the reddish, light wood used extensively in greenhouses and similar places where resistance to decay is important.

Plant ecologists have noted for many years that the cypress is a variable tree. In swamps the plant has a broader head and develops the root projections known as "knees." On dry soils the plant has an erect conical shape with a central trunk and resembles some of the other conifers in habit. The branches are spreading.

The cypress is deciduous, the small flat needles are shed in the fall after changing from yellow to brown. The needles are in two rows along the branchlets, and give a pronounced feathery appearance to the plant. As a young plant the cypress is erect and conical. In maturity it develops into a tall majestic spire. The old trunks have a brownish bark and become buttressed at the base.

In cultivation either a wet or an ordinary garden location may be selected. Plants should preferably be handled with a ball when perfectly dormant. It should be given ample space so that the majestic aspect of the plant will not be lost.

For Your Benefit

At the suggestion of one of our members, we are announcing that we shall return to a plan tried years ago with little success, namely to open to members the columns of the Gardener's Pocketbook, in order that they may list their desiderata which they cannot find in catalogues nor over the neighbor's fence.

In order to avail yourself of this service, your lists must be in two months before the month of the issue, i.e. November for January, February for April, May for July and August for October. If you hurry you can make it for this issue. If in the opinion of the Editor, the inquiry can best be answered by an office letter, he reserves the right to do so, since all members do not have access to all the catalogues that come here.

The American Horticultural Society

INVITES to membership all persons who are interested in the development of a great national society that shall serve as an ever growing center for the dissemination of the common knowledge of the members. There is no requirement for membership other than this and no reward beyond a share in the development of the organization.

For its members the society publishes THE NATIONAL HORTICULTURAL MAGAZINE, at the present time a quarterly of increasing importance among the horticultural publications of the day and destined to fill an even larger role as the society grows. It is published during the months of January, April, July and October and is written by and for members. Under the present organization of the society with special committees appointed for the furthering of special plant projects the members will receive advance material on narcissus, tulips, lilies, rock garden plants, conifers, nuts, and rhododendrons. Membership in the society, therefore, brings one the advantages of membership in many societies. In addition to these special projects, the usual garden subjects are covered and particular attention is paid to new or little known plants that are not commonly described elsewhere.

The American Horticultural Society invites not only personal memberships but affiliations with horticultural societies and clubs. To such it offers some special inducements in memberships. Memberships are by the calendar year.

The Annual Meeting of the Society is held in Washington, D. C., and members are invited to attend the special lectures that are given at that time. These are announced to the membership at the time of balloting.

The annual dues are three dollars the year, payable in advance; life membership is one hundred dollars; inquiry as to affiliation should be addressed to the Secretary, 821 Washington Loan and Trust Building, Washington, D. C.