

ame?" "I will not go." This was all, and she vouchsafed no explanation. But what I had seen gave me the key to a resolution which caused general surprise.

The Empress had intended to appear as a conventional Louis Quinze Diana, with powdered hair and a profusion of diamonds; but there had been much discussion as to whether she ought to wear this dress. There was no impropriety in the arrangement of the costume itself, which I saw on another occasion worn by the young and very pretty Princess Anna Murat,<sup>1</sup> to whom the Empress had given it after being reluctantly persuaded that it was unsuitable to the dignity of her position. It was not easy to make the Empress understand that she could not do what other people did, and that many things must be abstained from,

<sup>1</sup>A descendant of the marshal, who was for some time king of Naples, and of his wife, Caroline Bonaparte, one of the first Emperor's sisters.

though unobjectionable for others. On this occasion the dress was prepared and laid out in the room reserved for her use; and while still undecided as to whether or not she would appear as Diana, she examined what was in readiness for a fancy quadrille, in which some of the dancers were to figure with the pasteboard horses seen in a circus, where the apparent rider moves inside the trappings. This took her fancy, and she immediately made the trial of one herself; but once inside, she could not get out again, and none of her ladies knew how to extricate her. Finally Comte Robert de Tascher was called to the rescue, and succeeded in removing the inconvenient appendage, while the Empress was much amused by the adventure. He came to tell us of it in the ball-room, adding the information that she had decided not to wear the Diana dress, and would be present concealed in a domino.

(Conclusion next month.)

Anna L. Bicknell.



## AQUATIC GARDENING.

### WATER-PLANT CULTURE FOR THE ESTATE, THE GARDEN, AND THE HOUSE.



NOVEL and charming feature of some of the most elaborate dinner entertainments at Newport during recent summers has been the employment of night-blooming water-lilies for table decoration. Their exquisite beauty, varied and delightful fragrance, and great diversity in size, form, and color, were virtually a new revelation to many admiring guests; indeed, it was a surprise to learn that so many of the Nymphaea belonged in the night-blooming class. If these beautiful flowers could be supplied in winter at any price they would no doubt be fashion's favorites in New York. Now, one might as well seek roc's eggs in our markets as water-lilies in any but the summer months. In two or three years, however, it is not at all improbable that they may grace our Christmas tables, though necessarily at such cost as will always prevent their becoming common. For their cultivation specially constructed hot-houses would be requisite, with tanks instead of benches, taking up many times as much

space as the growth of an equal number of roses would require; and the adequate heating of such establishments would be a serious matter. It might also be found necessary, during cloudy weather and the dark days of December and January, to supply electric illumination to take the place of sunlight; and that would be by no means inexpensive. Beyond mere considerations of cost there would probably be no more difficulty in forcing water-lilies than any other flowers.

Aquatic gardening in general is very much better understood in this country now than it was a few years ago. For a long time it was here a neglected branch of horticulture, practised only by a few, and in such ways as evoked more curious surprise than emulation among the many. As early as 1839, Mr. R. Buist of Philadelphia grew nelumbiums (both *speciosum* and *album*); and in 1851, only two years after its discovery, that grandest of all water-lilies, the *Victoria regia*, was flowered by another Philadelphian—Mr. Caleb Cope. But ignorance of the culture of aquatic plants inspired the pop-

ular delusion that it presented great difficulties, and this error was much encouraged by the wholly unnecessary trouble lavished on those grown by professional gardeners. It was then supposed impossible to flower the *Victoria regia* except in a hothouse where a high temperature was constantly maintained, and in water not only warm, but also kept in motion by the incessant gentle turning of a small paddle-wheel, simulating the current of a tropical river. As for the lotus, which was first brought here from Calcutta, nobody doubted that a breath of cold air would be instantly fatal to it. But it has been found that the queen of water-lilies will bloom very well — better, indeed — in open-air basins of still water, warmed only by the summer sun. Mr. E. D. Sturtevant has demonstrated that the lotus is perfectly hardy at least as far north as Massachusetts, living under the ice through our hardest winters, and flourishing so rankly that if not kept in check it will speedily take entire possession of any pond in which it is introduced. These facts being established, people began to suspect that perhaps aquatic gardening might be easier than they had supposed, and that many water and bog plants already known to be very charming in their natural homes could possibly be grown without much difficulty. The numbers of those who essayed such experiments increased from year to year, but slowly. It was not until 1883 that aquatic gardening gained any considerable prominence even in Philadelphia, where it had first been introduced; not until 1886 that it was made a conspicuous feature in the parks and public squares of New York; and when, in 1888, Mr. L. W. Goodell of Dwight, Massachusetts, exhibited a tank of aquatic plants before the Massachusetts Horticultural Society, they excited actual enthusiasm as much by their novelty as by their beauty. Since then, in all the public gardens of the principal cities, basins have been established wherein, during summer, varieties of the *Nymphaea* and other aquatic plants have been grown, and have proved a potent attraction for popular interest. Owners of rural estates, too, have done much to encourage development of popular taste in this direction, by transforming into water-gardens previously neglected and unsightly swamps and ponds. Generally the improvements have been limited to the extirpation of valueless weeds, and the substitution in their stead of hardy water-lilies and lotuses, which have then been left to take care of themselves; but even that much has often effected wonders.

The only aquatic garden worthy of the name near New York is at Clifton, New Jersey, which, although only a little over four acres in extent, is probably the largest, costliest, most complete and comprehensive in this country. Six

years ago it was an ugly and treacherous bog, containing several ill-defined ponds connected by spring-fed streams, the whole filled with a rank growth of deleterious weeds, and infested by musk-rats, snakes, and mosquitos. Mr. S. C. Nash, the owner of the property, determined upon its reclamation. Deep drainage, well-planned piping for control of the subterranean springs, heavy embankments and long lines of sheet-piling, thorough uprooting of the indigenous growths and deep layering of sand to smother them beyond resurrection, made the undertaking long and costly. The first season after the completion of his ponds, Mr. Nash planted them with the Egyptian lotus (*Nelumbium speciosum*) and the most charming varieties of the hardy *Nymphaea* — *N. odorata rosea* (the famous pink water-lily of Cape Cod), *N. odorata gigantea*, *N. tuberosa*, and others. In the low margins he established irises, wild rice, sedges, and the noble grasses. The higher ground, sloping up into the bordering forest, he filled in with hardy shrubs and perennial plants (mostly native) possessing special charms of foliage or bloom in season, dotting them about in such a natural way that nothing artificial was apparent in their arrangement. The next year he increased by at least a dozen the varieties of his water-lilies, and added a number of other water and bog plants. He also made further important improvements, building brick and cement basins to shield tropical lilies from the exceedingly cold spring water, and constructing a semi-subterranean boiler-house beside the largest basin, to supply sufficient heat there for carrying *Victoria regia* plants through the perilous season of spring. The first season after these preparations he flowered the *Victoria regia* in the open air, and he has continued to do so with unqualified success every summer since, at the same time making additions to and extensions of his garden in other directions, until the attainment of its present magnificent condition. What that condition is may be realized partly from the illustrations accompanying this article, all of which are from views taken in his garden by Mr. S. C. Nash himself, he being an exceptionally skilful amateur photographer as well as horticulturist.

A year ago Mr. William Tricker, who at Dongan Hills, Staten Island, had already made a reputation as a grower of aquatic plants, joined Mr. Nash, and a range of propagating-houses was constructed — adjoining Mr. Nash's extensive rose-houses — for the growing of all varieties of water and bog plants known in this country or procurable from abroad. Short as the time has been since then, surprising progress has been made toward the realization of that ambitious purpose. There

are at least sixty varieties of water-lilies, and their numbers are being increased every year by hybridization, so it would hardly be reasonable to expect them all in a single garden, even such an extensive one as this. But it is safe to say that perfectly grown and blooming specimens of all the choicest and most desirable kinds are to be found in these basins and ponds throughout the summer months; and young plants of nearly all the others are kept in the propagating-houses.

Externally these houses are of the general style of florists' hothouses; but their internal arrangement is different. Down the center of each runs a long line of wide, shallow, copper-bottomed tanks, each containing several inches of water. The space below them is inclosed by tightly fitted boards, and contains shelves for the support of very large kerosene lamps, which supply the most steady and accurately controllable bottom heat that can be given to the tanks. Along the sides — sometimes in two tiers — are placed rows of half-barrels, as many as can be accommodated, for the growth of plants that do not, either by nature or owing to their stage of growth, require bottom heat. All are nearly filled with water, which is in some cases clear, enabling one to see the earth-filled pots at the bottom, or the young plants pushing their way up to the surface, or the plants that flourish only when wholly submerged. In other cases the water is covered by a velvety carpet of minute floating plants, such as *Azolla Caroliniana*, *Salvinia natans*, or *Wolffia Columbiana*.

In the process of propagation, the thing to be started into growth, whether seed, bulb, tuber, slip, or portion of a root-crown, is buried in a pot of rich soil, which is then plunged to the bottom of a tub or tank of clear water at the proper temperature for its development; the exceptions to this treatment being the floating plants, which possess such vitality that it is only necessary to throw a spray, or even a leaf, from an old plant upon the surface of the water.

From the small pots in which the young plants make their first roots they are advanced, as their development requires, to larger ones, and at the same time the depth of water over them is proportionately increased, to give room for their lengthening leaf-stems and expanding leaves. It all seems very simple, and really is so; the main requisite to success in it being maintenance of temperature in the water exactly suited to the several kinds of plants. That is the service for which the big lamps beneath the tanks come in play. The atmospheric temperature required is about the same for all, — seventy degrees Fahrenheit, — excepting the hardy *Nymphaea* and *nelumbiums*,

which are grown in cooler houses after being started in the hot ones.

As days grow longer and warmer in spring, the heat of the humid atmosphere of the houses, and of the water where the young plants are by this time flourishing luxuriantly, is gradually diminished. When the sun shines brightly the roof ventilators are opened a little more each day, that the plants may be by degrees sufficiently hardened for outdoor exposure. By the middle of May the hardy *Nymphaea* and *nelumbiums* — which, although started only in January and February, already threaten to outgrow their tankage space — may be planted in the ponds ready to receive them. Early in June all the tropical water-lilies, excepting the *Victoria regia* and *Victoria Randi*, may safely be put out and trusted to take care of themselves; and a great variety of smaller species of aquatic and bog plants adapted to outdoor cultivation may also now be assigned to their permanent locations.

But the tubs contain many exquisitely beautiful and singular plants much too dainty and delicate to be exposed in even the best-protected open-air basins, and others which, even if they survived such exposure, would be, the season through, as much lost to sight as if they had ceased to exist, their habit being to live only in total submergence. The most noteworthy of these is, no doubt, that rare and exceedingly curious plant, the *Ouvirandra fenestralis* of Madagascar, otherwise known as the "lace-leaf" or "lattice-leaf" plant. Not only does it hide itself deep in whatever water it may be placed, but it must be shielded from sunlight by shades or a mask of floating plants above it. Only in the blooming season does it shyly peep out from its seclusion. Then it timidly raises its insignificant white flowers above the surface of the water for a few hours, and again retires to its congenial obscurity. To get sight of it one must sweep aside the floating screen masking the water, and take care to stand between it and the sun. But it is worth more trouble than that to see so strange a plant. Its dark olive-green leaves are simply square meshed networks of vascular tissue, as if they had been "skeletonized," spread out horizontally, growing with symmetry, but with exceeding slowness. The smallest specimens are worth five dollars each, while old plants, with leaves eighteen inches long and six inches wide, will command almost any price. A very little chill is liable to prove fatal to it.

Mention of this strange plant suggests remembrance of another, in some respects even more odd — one so freakish and mysterious in its ways as to seem almost uncanny. Gray christens it *Wolffia Columbiana*, and says it is to be found pretty much all through our Mid-

dle States. Nevertheless, few persons have ever found it, which is not strange, in view of its habits. When it chooses to be visible, *Wolffia* appears as a sheet of bright green globules, each a little smaller than a BB grain of shot, floating on the water. Examined in the sunlight under a magnifying glass, each tiny globule is surprisingly beautiful, a semi-transparent sphere of emerald, refracting vivid green light from stellar points in its interior, as if it were crystalline. One can scarcely accept the assurance that it is a plant, not a gem. Crushed, it

There is a largely prevalent but erroneous impression that tropical water-lilies are very delicate and need much coddling. That a high temperature is desirable for the germination of their seed, and that the young plants should not be exposed to the raw winds and chilling storms of early spring, are quite true; but by the first week in June the weather is sufficiently settled and warm in this latitude to suit even those the natural habitat of which may be Mexico, India, Egypt, or Zanzibar, with the exceptions of the great rival queens of the



DRAWN BY HARRY FENN.

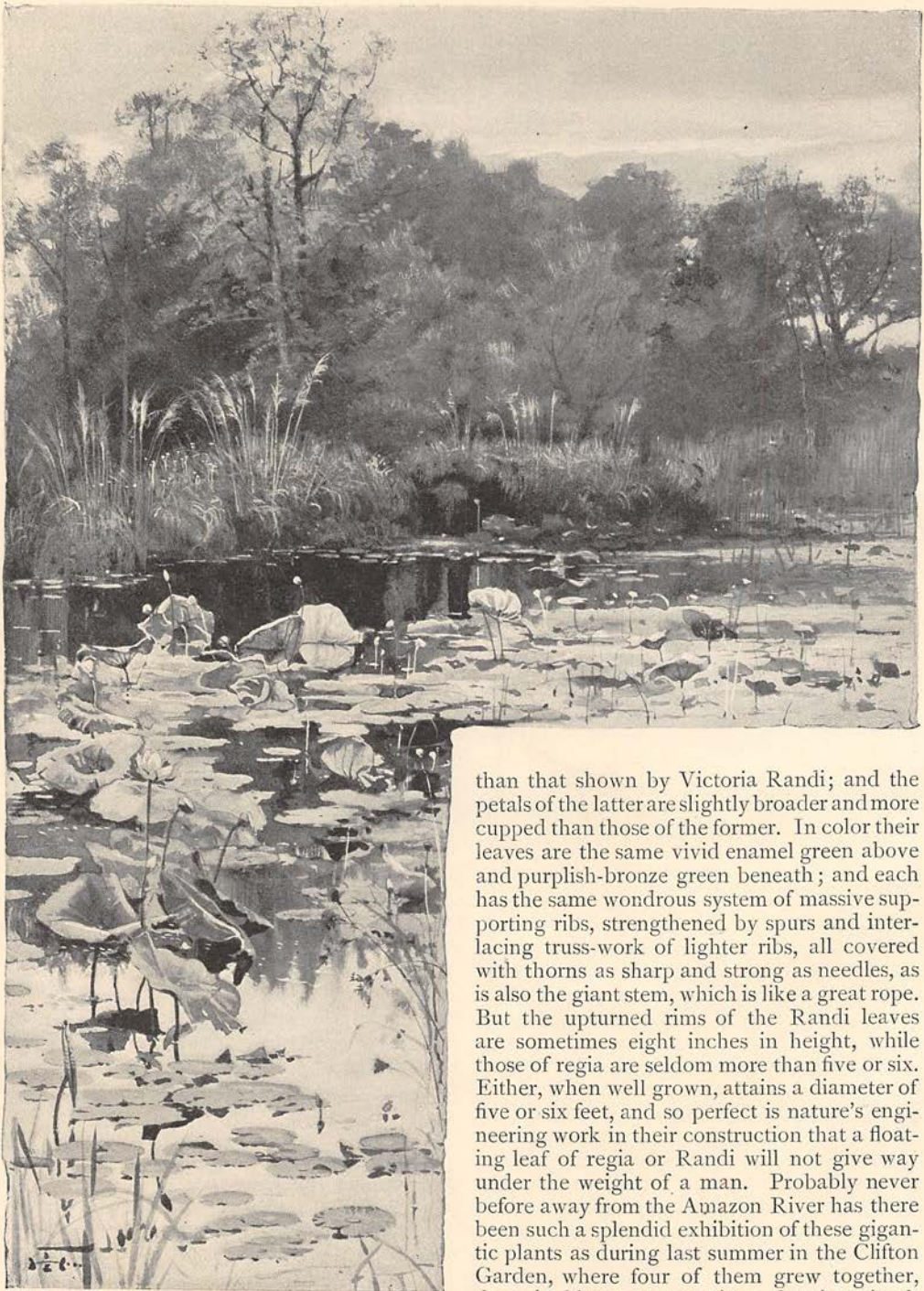
THE POND, BEFORE TREATMENT.

FROM A PHOTOGRAPH.

resolves itself into almost microscopic globules, each apparently as perfect as an uncrushed one, each with a minute bright star of green light in its center. One day *Wolffia* suddenly appeared at the Clifton Garden in a tub of water that had not been changed in months. Whence it came no one could imagine; but there were thousands of its globules that seemed to have arrived all at once. It became an interesting feature of the garden, always exciting the curiosity and admiration of visitors, and was under observation daily, until one morning when it was looked for and not found. Every globule had disappeared. Fine-meshed strainers were passed through the water, the bottom and sides of the tub were scraped, but without result. Its going was as mysterious as its coming had been. Two or three days later it reappeared in the same tub more abundantly than before; and ever since it has vanished and reappeared in the same inexplicable way.

Amazon. Moreover, planting them is a much less painstaking operation than setting out young cabbages. Each one is dumped out of the pot in which it has been grown, with the ball of earth about its roots, and is dropped into the pond, to settle down on the muddy bottom and look out for itself.

But for the flowering of *Victoria regia* and *Victoria Randa* the program is different. A calm, sunny day in May, before they have grown too large for convenient handling, is availed of for their transference from the hothouse tanks to the outdoor basin, the water of which must first be well warmed by steam-heating pipes in the bottom. When the young plants are in place, a tight roof of glass is fitted over them, to be opened only on sunny days, a little at a time, as the season advances. Not before July is it deemed safe to give them full exposure day and night. The flowers of both are enormous, the largest of all water-lilies, and, when



DRAWN BY HARRY FENN.

FROM A PHOTOGRAPH.

THE MAIN POND—LOTUS AND GRASSES.

they first open, they are snow-white; but on the second day those of *Victoria regia* are suffused with a pinkish flush less deep in tint

than that shown by *Victoria Randi*; and the petals of the latter are slightly broader and more cupped than those of the former. In color their leaves are the same vivid enamel green above and purplish-bronze green beneath; and each has the same wondrous system of massive supporting ribs, strengthened by spurs and interlacing truss-work of lighter ribs, all covered with thorns as sharp and strong as needles, as is also the giant stem, which is like a great rope. But the upturned rims of the *Randi* leaves are sometimes eight inches in height, while those of *regia* are seldom more than five or six. Either, when well grown, attains a diameter of five or six feet, and so perfect is nature's engineering work in their construction that a floating leaf of *regia* or *Randi* will not give way under the weight of a man. Probably never before away from the Amazon River has there been such a splendid exhibition of these gigantic plants as during last summer in the Clifton Garden, where four of them grew together, three in bloom, at one time, showing simultaneously as many as five of their enormous flowers, and twice as many buds in various stages of development. Professor Morong, the curator of the botanical collection in Columbia College, who had seen thousands of these

lilies growing wild in the Amazon, affirmed that their leaves when so grown were smaller than those of cultivated plants, and that their flowers possessed no fragrance. But both regia and Randi when blooming at Clifton load the air for a hundred feet about the basin with an exceedingly delightful odor somewhat resembling the scent of pineapples. It was Professor Morong's opinion that this quality had been developed in them by cultivation.

Ten years ago nine persons out of ten in this country, if asked the color of a water-lily, would have confidently responded, "White, of course." But since then knowledge of the beautiful pink lily of Cape Cod has spread; the intense blue lily of Zanzibar has been brought to popular cognizance; and some acquaintance has been formed with the charming golden-yellow lily of Mexico. Even yet, however, it is not commonly known that among this class of flowers are pearly, snow, and creamy white; many gradations of rose-pink, red, and carmine; a great variety of shades of blue and violet; various tints of yellow and orange; and that the mysterious art of the hybridizer is constantly evoking new varieties, with novel and exquisite gradations and combinations

of those colors. In the quality of perfume water-lilies differ quite as widely as the scented blossoms of our land gardens. Rose, jasmine, heliotrope, and wallflower have odors not less alike than those of certain sorts of the *Nymphaea*. Some are cup-shaped and others star-like; some are eleven inches across, others hardly larger than a silver quarter-dollar; some spread their loveliness proudly in the sunlight, others bloom only at night. Happily, in all this wealth of choice one cannot go far astray, for none are undeserving of our loving care and admiration.

Of the hardy varieties for permanent establishment in Northern ponds, none better can be found than those already mentioned as leading Mr. Nash's original selections; but if sufficient space is at command, the list may be judiciously enlarged by the addition of *N. alba* and *N. alba candidissima* (English white water-lilies), *N. candida* (Bohemian, white), *N. Marliacea chromatella* (yellow, with orange stamens; one of M. Marliac's hybrids), and *N. pygmaea* (Chinese, white and fragrant, the smallest water-lily yet known).

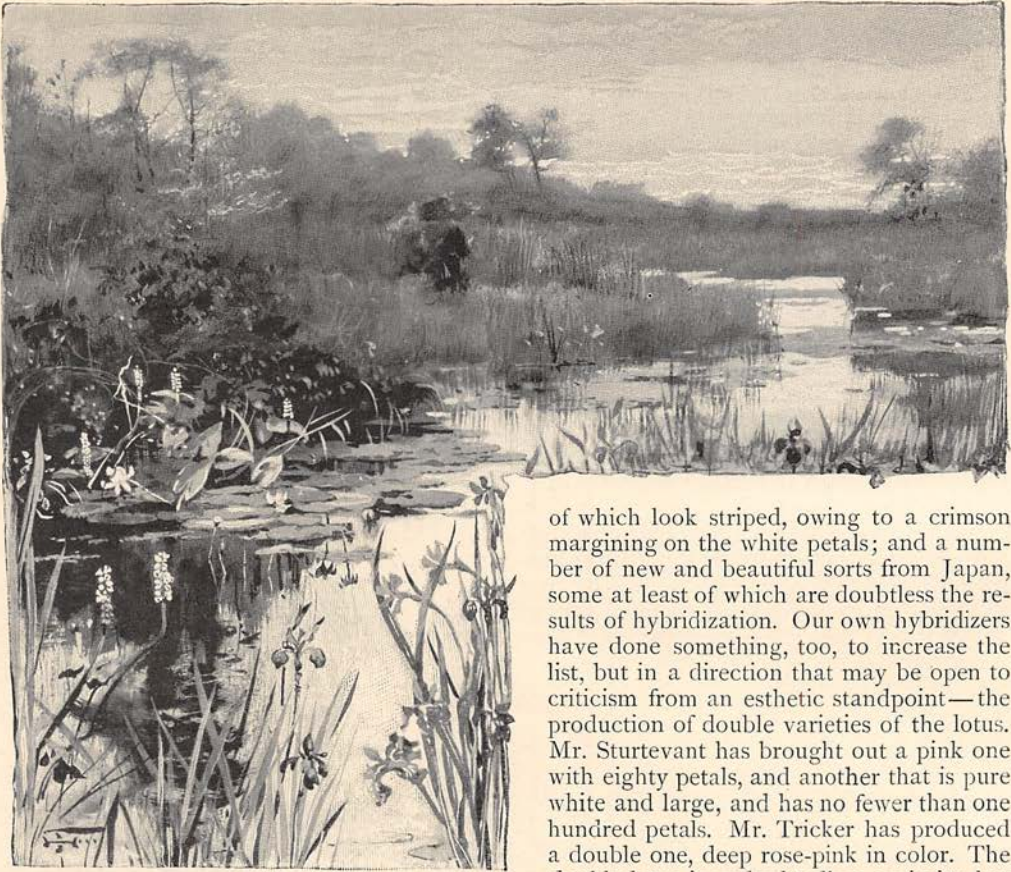
In planting nelumbiums — which will, of course, be desired among the first settlers in



DRAWN BY HARRY FENN.

A LOTUS CLUMP IN THE VICTORIA POND.

FROM A PHOTOGRAPH.



DRAWN BY HARRY FENN.

FROM A PHOTOGRAPH.

THE EDGE OF THE POND—FLAGS AND ARROWHEADS.

of which look striped, owing to a crimson margining on the white petals; and a number of new and beautiful sorts from Japan, some at least of which are doubtless the results of hybridization. Our own hybridizers have done something, too, to increase the list, but in a direction that may be open to criticism from an esthetic standpoint—the production of double varieties of the lotus. Mr. Sturtevant has brought out a pink one with eighty petals, and another that is pure white and large, and has no fewer than one hundred petals. Mr. Tricker has produced a double one, deep rose-pink in color. The double lotus is undoubtedly a curiosity, but it lacks the ethereal grace of the single varieties.

this new garden—the cultivator will do well to see that a stout brick wall incloses the space allotted to them. If he neglects this precaution, they will invade every part of the pond, and in a surprisingly short time take entire possession of it. No room is left for anything else to grow among lotuses. They send off stolons in all directions, often to a distance of several yards, each of which, at its extremity, forms a tuber deep down in the mud, beyond the reach of frost. The next spring each tuber becomes a plant, sending off stolons on its own account, provided there are no muskrats within reach of them during winter. Until five or six years ago hardly anybody in this country, except botanists and a few professional gardeners, knew more than two varieties of nelumbiums—*speciosum* (the Egyptian lotus) and *luteum* (the American yellow lotus). Now, however, we have *N. album grandiflorum*, which bears exceedingly large white flowers; *N. roseum*, the blooms of which are of a deep rosy pink; *N. Kermesinum*, which shows a more delicate shade of pink; *N. striatum*, the buds

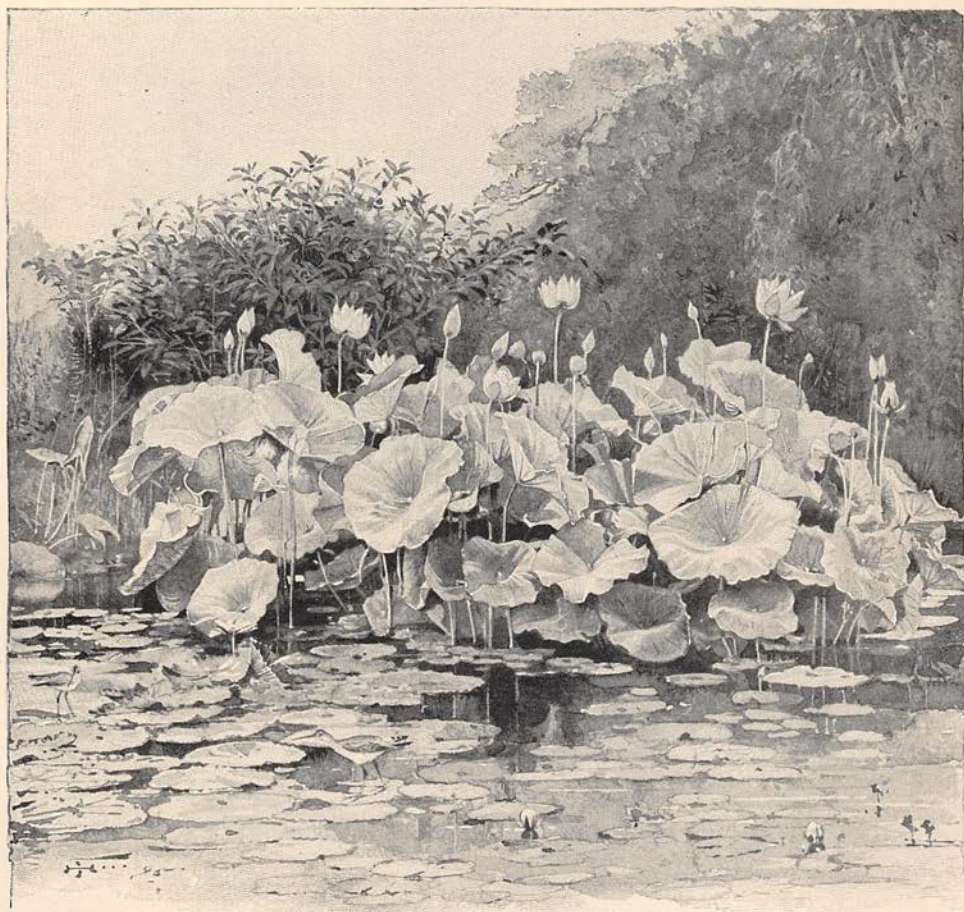
Among land or water plants there is none more magnificent than the lotus. Even if it never bloomed it would still be worthy of admiration, for in grace of form and beauty of color its foliage is unrivaled. The superior surface of its leaves is of a soft glaucous green in which light and shade play with constantly changing effect, as they sway and undulate responsive to every gentle zephyr. It repels water, and drops of rain or dew falling upon it appear like globules of quicksilver, quivering, dancing, and rolling until they gather in the depressed center, where they seem a pool of molten silver. And the leaves presenting these effects are great ones,—generally as much as three feet in diameter,—supported by stems five or six feet long, and borne in such profusion that at a little distance it is not easy to individualize one from what seems a billow of foliage. High above rise the great flowers, each curving petal of which is four or five inches in length by half as much in width, rich in perfume, so sweet, voluptuous, fascinating, that no other floral fragrance can compare with it.

The aquatic garden containing only the *Nymphæa* already mentioned and lotuses would be an ample delight to most persons, but an enthusiast in this department of horticulture would scarcely be content so long as it lacked at least a fair representation of the tropical water-lilies. These tropical *Nymphæa*, it is of course understood, are to be treated as annuals, and, excepting the requirement of heat for starting the germination of their seeds, involve no greater difficulties than any other annuals common in our gardens. For the needed warmth all that will be required for stocking any ordinary private garden may be started in vessels of moist earth over a steam-radiator in a dwelling-room, or on the back of a kitchen range.

All the night-blooming water-lilies are in the tropical or tender section. The best white one among them is *N. dentata*, a native of Sierra Leone, which has large, star-shaped, fragrant flowers and elegant buds, long and pointed.

*N. lotus*, a native of Egypt, also has white flowers, cup-shaped, with red-margined sepals. *N. rubra*, an East Indian variety, bears slightly cup-shaped flowers of bright but tender rosy tint. *N. Devoniensis*, an English hybrid, but so tender as to require treatment as a tropical, has very large flowers of deeper and more brilliant rosy color than those of *N. rubra*.

Among the day-blooming tropical water-lilies the most effective is no doubt *N. Zanzibarensis*. The distinctive character of its flowers, which are star-shaped and of an intense blue color, with sepals dark green outside and purple within, commanded notice and interest wherever they were exhibited; and as the plant was introduced several years ago in the public gardens of nearly all our principal cities, this variety has been made familiar to the public generally more than any other of the tropical *Nymphæa*. Consequently it has been an exceptional favorite for experimental private cultivation; and as it has been proved one of the easi-



DRAWN BY HARRY FENN.

LOTUS AND POND-LILIES.

FROM A PHOTOGRAPH.



est to grow, flourishing and blooming even in a tub, it will, no doubt, before long become as common as any of our native water-lilies. It is well to remark, however, that all its seeds do not produce like flowers. The deep, dark blue distinctive of the type is often greatly modified, and some of the modifications give rise to permanent strains essentially different from the original. *N. Zanzibarensis azurea*, for instance, which bears beautiful flowers of bright azure blue, is a seedling which seems to have attained a fixed habit, and the same may be said of *N.*

Tricker and Mr. Sturtevant. Probably the most charming among them is *N. Laydekeri rosea*. Its flowers, upon opening, are of a delicate pink tint, with rich golden center; but on the second day the stamens deepen from gold to orange, while the petals are snow-white internally and a deeper pink externally, and on the third day all the petals are suffused with a deep rosy flush. As they are borne profusely, and consequently are shown at the same time in the different stages of development, the plant seems to produce dissimilar flowers. Mr. Sturte-



DRAWN BY HARRY FENN.

A WATER BABY—VICTORIA REGIA, MUSA, PALM, ETC.

FROM A PHOTOGRAPH.

*Zanzibarensis rosea*, which produces flowers of deep rose-color. The finest yellow water-lily is *N. Mexicana*, from New Mexico, the petals of which seem of burnished gold. It is not one of the large sorts, seldom exceeding five inches in diameter, but the plant flowers very freely all season, until checked by frost. *N. carulea*, an African water-lily, is star-shaped, of clear, light-blue color; and another handsome blue is *N. scutifolia*, from the Cape of Good Hope.

Some of the handsomest water-lilies are hybrids, the results of skilfully crossing two distinct natural varieties. The greatest successes in this line have been achieved by M. B. Latour Marliac of France; and in America by Mr.

Tricker and Mr. Sturtevant. Probably the most charming among them is *N. Laydekeri rosea*. Its flowers, upon opening, are of a delicate pink tint, with rich golden center; but on the second day the stamens deepen from gold to orange, while the petals are snow-white internally and a deeper pink externally, and on the third day all the petals are suffused with a deep rosy flush. As they are borne profusely, and consequently are shown at the same time in the different stages of development, the plant seems to produce dissimilar flowers. Mr. Sturte-

vant's best hybrid is one named after him — *N. Sturtevantii*, a bright, rosy-red flower, cup-shaped, and of very large size. Mr. Tricker has produced five exceptionally fine hybrids: *N. Columbiana*, the deepest carmine water-lily yet known; *N. Smithiana*, cup-shaped, white, slightly suffused with pink; *N. Deania*, pink; *N. delicatissima*, an extremely light pink; and a new one, not yet named, of great size and of an exquisite shade of blue. All these hybrids save *N. Laydekeri rosea* are tender, but present no great difficulty in cultivation.

Anybody who can command a little patch of ground whereon the sun shines — even a city back yard, where earth-grown plants speedily

shudder themselves out of a poisoned existence—may cultivate, in tubs or half-barrels a superb variety of aquatic plants. Even lotuses and water-lilies can be grown in this way, and with less trouble, special knowledge, or dependence upon surrounding conditions than are involved in any other sort of gardening. When the tubs have been filled with good, rich earth, covered by an inch layer of sand or fine gravel and a proper proportion of water, and the chosen plants have been placed in them, the trouble is ended.

A very charming miniature aquatic garden may be maintained in aquariums, even in bowls, placed before sunny windows. Wherever other plants could be grown in pots, aquatic ones will flourish in anything that will hold water.

The water-lilies best adapted for cultivation in tubs are *N. Zanzibarensis*, *N. Laydekeri rosea*, *N. pygmæa alba*, *N. pygmæa helviola* (sulphur-yellow), and *N. elegans* (white, tinged with purplish blue). It must not be expected that lotuses grown in this way will attain such magnificent proportions as those in open ponds, or that bringing them into shelter will keep them growing in winter, which is their season of rest; and to have them do well, all the space possible should be given to them. A half-hogs-head would be better than a half-barrel. For them and for the water-lilies the water need be only five inches in depth, and the soil about ten, with an inch, or a little less, of sand to keep the lighter particles of fertilizing material from floating. The water should always be clear.

Decorative effect, either in open-air or indoor aquatic gardens of these minor classes, is best attained by combinations of plants made with due regard to their several habits of growth: with limited exception to this rule, of course, in the case of such as are cultivated for their flowers, and to which it is therefore desirable to accord all disposable space. Here are suggestions, illustrative of both the rule and the exception, for the planting of five tubs, any of which will give charming results.

First. In the center, *Cyperus alternifolius* (a very ornamental aquatic grass, from eighteen to twenty-four inches high), three plants of water-hyacinth and three of water-lettuce (*Pistia stratioides*) alternated, with *Azolla Caroliniana* (a lovely little floating moss) sprinkled between. Parrot's-feather (*Myriophyllum proserpinacoides*) may be put around the edge, and trained to throw its delicate whorls of greenery over the sides of the tub, which it will soon cover completely; but care must be taken to prevent its spreading to the interior also. Four inches of water and eight of soil will suffice for these plants.

Second. In the center, one to four plants, ac-

ording to their strength, of *Cyperus papyrus* (the "Egyptian paper-plant"), which grows four or five feet tall; four of *Peltandra Virginica* (sometimes called "water-arum") disposed about it, with parrot's-feather allowed to fill the spaces between. The water-arum has calla-like leaves, growing twelve to fifteen inches out of the water, and bears greenish flowers of the calla type. Three inches of water over the soil will be enough in this tub, as these plants require much earth.

Third. This may be given up entirely to *Aponogeton distachyon* (Cape pondweed), a charming plant, not yet as well known as it should be, which grows luxuriantly, and produces, winter and summer, curious white flowers which have a delightful hawthorn fragrance. If desired, *Azolla Caroliniana* or *Salvinia natans* (another beautiful little floating plant) may be scattered among the *Aponogeton*, to mask the water until the latter covers it, as they flourish anywhere, accommodate themselves to circumstances, and are always admirable. Equal proportions of soil and water will be best for this tub.

Fourth. This should have ten or a dozen plants of *Limnanthemum Indicum* (water-snowflake) surrounding a central mass of the grand *Thalia dealbata*. The flowers of *Limnanthemum* are the daintiest, most exquisite little white stars imaginable, seemingly covered with frost-work or snow crystals, and the leaves are like those of a water-lily, though only four or five inches wide; while the *Thalia* is an imposing plant, three or four feet high, with big leaves on long petioles. Four or five inches of water and eight or nine of soil are sufficient.

Fifth. This may be like the preceding, except that for the water-snowflake should be substituted the water-poppy (*Limncharis Humboldtii*), and, instead of *Thalia*, the giant arrowhead (*Sagittaria Montevidiensis*), which carries huge leaves on tapering stalks four or five feet high, and bears large white flowers. The bloom of the water-poppy is yellow, with black stamens.

As a sort of appendix to this incomplete list, I may mention *Hydrocharis Morsus-ranae* (frogbit), a British aquatic plant which has beautiful foliage of a very pleasing shade of green, and bears pretty white heart-shaped flowers. It is a floating plant, requiring no soil to root in, and may therefore be used with excellent effect in aquaria containing submerged plants.

Fish should always be kept with plants in an aquarium, not simply because their colors and motion add a pleasing effect, but for their service in devouring insects; and in open-air ponds they are quite indispensable.

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