



TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1883.

PART I.



BOSTON :
PRINTED FOR THE SOCIETY.

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The following papers and discussions have been circulated to some extent in the form of slips reprinted from the reports made by the Secretary of the Society in the Boston Transcript. As here presented, the papers are printed in full, and the discussions are not only fuller than in the weekly reports, but have been carefully revised by the speakers.

The Committee on Publication and Discussion take this opportunity to repeat what they have before stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature in the papers and discussions now or heretofore published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly.

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| BENJAMIN G. SMITH, | } | <i>Committee on Publication and Discussion.</i> |
| JOHN B. MOORE, | | |
| WILLIAM H. HUNT, | | |

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 6, 1883.

A duly notified stated meeting was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The Recording Secretary being absent, owing to illness, E. W. Wood was chosen Recording Secretary *pro tem*.

The President delivered his annual address, as follows :

ADDRESS OF PRESIDENT HAYES.

Ladies and Gentlemen of the Massachusetts Horticultural Society :

To this temple, dedicated to the science and art of Horticulture, we have come this morning to renew our vows of devotion to the loved duties and pleasures associated with the place ; to reciprocate kindly greetings of the new year ; to cheer and stimulate each other in our work ; and while grateful to Divine Providence for what has been accomplished by our institution in the past, to resolve that in the future we will do more than heretofore, according to the strength and means afforded us, to fulfil the beneficent mission of our organization.

We have great cause for thankfulness that able and wise men in past years established this Society, and that by their efforts, and those of their associates and successors, so much has been done for the improvement and profit of the community. It is very

pleasant to think that the benefits of this Society have not been limited by state lines or national boundaries, but that all the world has to some extent participated with us in the advantages resulting from the establishment of our institution. While we rejoice that so much has been done for the general good, by this Society since its origin, we should be animated by the desire to do more and more every year, as our knowledge and ability increase, that future generations may, by our example, be incited to take up the work when their predecessors are obliged to lay it down, and with loving diligence prosecute it to the glory of the Creator and the good of mankind.

Since our last annual meeting, I am happy to report good progress in the Society's work. Our exhibitions have been beautiful, instructive, and successful. The essays and discussions, which have been listened to by large audiences at our meetings with great satisfaction, have been able and interesting. Never before have our meetings been so well attended as the past year, thereby manifesting an increased interest of our members and the community at large, in horticultural subjects. The publication of our TRANSACTIONS has elicited the commendation of sister societies, and of many others in different parts of the world. Our library is in a better condition than it ever was before; its treasures are rapidly increasing, and, under the present excellent management, its usefulness has been much augmented. During the past year, our librarian, with the assistance furnished him, has made considerable progress in cataloguing the valuable prints in our possession, and this work will be prosecuted during the present year. Additional bookcases, and other conveniences for the library room have been provided, and rules for its use adopted, so that now it has become a favorite resort for our members, and others interested in horticultural studies.

I am happy to report an improvement in our financial condition during the past year. We have received a flattering increase in the rental of our halls over the previous year, proving the wisdom of the Society in making the improvements in our building in 1881. The Treasurer's accounts, when presented, will show that we have now about four thousand dollars more of cash on hand than we had on our last anniversary. Besides this, the returns from Mount Auburn Cemetery, not yet officially communicated to us, will exhibit an increase of revenue coming to this Society of about seven hundred dollars above the sum returned a year ago.

Though gratified with this report of increase of our income, we must bear in mind that we cannot depend upon this increase being permanent, and, moreover, if we make the contemplated improvements of our building, we shall lose during the progress of the work the rentals of our stores, and shall need this surplus to supply probable deficiencies.

We are greatly in want of means to accomplish the important objects of the Society's formation. We require more money than we have, to stimulate growers of flowers, fruits, and specialties. More and larger premiums should be offered for excellence in these departments. Liberal premiums should be given for improvements in the culture of land, for the destruction of enemies to vegetation, for remedies for diseases in plants, and for discoveries of new and valuable productions. Larger pecuniary inducements than we now can afford should be offered for procuring the best essays upon horticultural subjects and for their publication.

We have now excellent halls for our exhibitions, a good library room which is capable of enlargement for receiving our books; convenient rooms are provided for the transaction of the business of the Society's officers, and now we must improve the condition of the lower portion of our building, better adapting it to the wants of business, if possible, that we may increase our rentals and at the same time add to the beauty of the structure. For some months during the past year, as we did not wish to renew the expiring leases of our stores, contemplating alterations of them, we have been obliged to rent them temporarily to those who would give us the largest rent. As it is desirable to procure as soon as possible the best class of tenants, and adapt our building to their wants, the committee having the subject in charge have deemed it judicious to advertise the Society's willingness to alter the first story and basement of our building if it were desired, and to ask proposals from parties wishing to hire the stores. The committee have thought, if from the answers to their advertisement, it seemed alterations of the building would result in such an increase of our income as to justify the expenditure necessary to make the improvements, that then they would turn their attention to providing the means required to accomplish the object without burthening the Society. Already some subscriptions for the purpose have been obtained, and I am certain you will cordially coöperate in improving our estate so as to give the Society additional revenue which is much needed to meet its increasing wants.

The advantage of offering valuable prizes for specialties in horticulture was illustrated again in our Rose Show of last summer. Though generally this beautiful plant had suffered much from the severe early frost in the preceding month of October ; yet by great care and labor, exhibitors showed very fine specimens of many varieties, which deservedly received the rewards of the Society and commanded the admiration of the public.

The Chrysanthemum Exhibition was perhaps the most remarkable one ever made in this country of this flower. All were charmed with it, so wonderful was the variety of color and form of the specimens shown, and the beauty of this exhibition, redounding so much to the credit of the exhibitors, will never be forgotten by those who witnessed it.

Observing the good resulting from offering special prizes, I am impressed with the great benefit which would result if we had the means of offering larger and more attractive prizes for many different specialties of horticulture.

It gives me great pleasure to bear witness to the valuable services rendered by all the committees during the past year, by which the dignity and high character of the Society has not only been upheld, but increased. We are, also, much indebted to the Treasurer and Secretary for the intelligent and faithful manner with which they have discharged their respective duties.

Ladies and Gentlemen: Bound together by a common love of nature, we have met, week after week, and month after month, to see the beautiful and useful products of the earth, to discuss their properties and peculiarities, their manner of growth and habit, and to receive and give information upon various horticultural subjects. Such association is not only pleasant, but necessarily profitable to us. We come to know each other better by acquaintance, and though at times we may differ as to the manner of best prosecuting our work ; yet we have learned little if we have not learned that by sincere and earnest devotion to our work our views are enlarged, and we are more ready to give credit to our fellow laborers for intelligence and ability, seeing how difficult it is for man to probe the secrets of nature, and that, not infrequently, most valuable discoveries are made through the humblest instruments. By coming together, and learning the experience of many, each of us makes far more rapid advance in our loved pursuit than can be made by the individual, solitary labor of any one. Finding how

much this association benefits us, it is plainly our duty to transmit to our successors, not only unimpaired, but augmented, the means of improvement which we have enjoyed.

In this spirit, we will cultivate more diligently than we have hitherto done, all those kindly offices to each other which give pleasure to social intercourse. We will, disinterestedly, and with a sacred regard to truth and principle, conduct ourselves in the performance of our duties and relations to each other, in accord with the purity of purpose and loftiness of character of our predecessors who founded and established this Society; and, with the blessing of Providence, we will maintain and enlarge its usefulness, doing our part in our day for that noble object, that its benign influence may be perpetuated and transmitted to future generations.

Hon. Marshall P. Wilder moved a vote of thanks to the President for his able and interesting address, which was passed unanimously.

John B. Moore moved that one hundred dollars be appropriated for floral exhibitions at the winter meetings, to be spent at the discretion of the Flower Committee. The motion was carried.

The Committee of Arrangements asked further time to report, which was granted. It was also voted to give the Treasurer further time to prepare his report.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

T. OTIS FULLER, of Needham.

JAMES HEWINS, of Medfield.

JOHN LANE, of East Bridgewater.

C. L. ALLEN, of Garden City, N. Y.

FREDERICK GODDARD MAY, of Dorchester.

Adjourned to Saturday, January 13.

MEETING FOR DISCUSSION.

WHAT IS THE BEST METHOD OF REPELLING OR DESTROYING THE INSECT ENEMIES OF FRUITS AND FRUIT TREES, ESPECIALLY THE CODLING MOTH? IS TRAPPING A PROVED SUCCESS? WHAT ARE THE RESULTS OF EXPERIMENTS WITH PARIS GREEN, OR ANY OTHER POISONOUS APPLICATION?

By JACOB W. MANNING, Reading.

Few fruit trees or plants can be found that do not suffer in some way from insect enemies. The fruit, also, of almost every useful tree or plant is more or less defiled or injured so as to be lessened in value, or ruined for the use of man, as well as for domestic animals in many cases.

One injurious insect after another comes on, covering much or all of the season of growth and development of fruit, and even extending through the season of the preservation of the fruit,—all this to the dismay of the fruit grower; so that it may well be said that the man who carries to market fine specimens of fruit is to be compared to a warrior in an enemy's country, who has succeeded by strategy and great labor and bravery, in gathering spoils; he is not always sure of securing more, for the enemy may come upon him. He is often in fear lest the numerous insect tribes will destroy all his most reasonable hopes before he can find a market for his crop after it is grown.

The army-worm and the grasshopper have often destroyed all fruit, cereal, and forage crops in sight of a given point in a few hours, and man must stand by helpless; but such serious and almost uncontrollable disasters happen only occasionally.

The canker-worm in a few days has destroyed all hope of fruit on the apple tree, and if this pest is not arrested, after a few years the life of the trees, annually denuded of their foliage in their most active season of growth, is to be despaired of.

The most effectual remedy we yet know of for the extermination of the canker-worm is "London Purple" or "Paris Green"; the first is preferable, I think, because, on account of its lightness and its finer division, it will remain suspended in the water, and does not require the constant agitation necessary with the Paris

green and water. The London purple has, also, a more prominent color, and can be seen more readily on the leaf.

The proper proportion is best found out by experiment; if it is too strong, it will kill the leaves; if it is too weak, it will not kill the worms. I have found that a heaping teaspoonful to a three-gallon pail of water was about right, or, on a large scale, about a pound to two hundred gallons of water.

It should be applied in a fine spray, either by a common garden syringe or by a portable pump and hose attachment. A supply of the poisoned water, with pump and attachment, may be moved in a wagon from tree to tree, and field to field. All the foliage should be sprinkled as far as possible. It is sometimes necessary to go over the trees two or three times to kill all the worms, but we have repeatedly seen cases where one application served to clear out the pest, and not a worm was seen again for years. This was the case in Amos Hill's orchard in Belmont, in 1878; also in 1880, in my own nursery, where thousands of apple and elm trees, in nursery rows, were cleared of the pest by one application. This was made when the worms were nearly mature; there were some trees in the grounds that escaped the poison, and it was supposed there were enough worms left to spread over the grounds the next year; but much to our satisfaction they have not been seen since. The only explanation I can give is, that the birds destroyed what were left after we had killed the greater part.

The time to apply the poison is, I think, as soon as the slightest perforation of the leaf can be seen, but it was effectual in my case when the worms were nearly grown.

I find that the foliage of the cherry, plum, three-thorned acacia, and linden are all more or less eaten by the canker-worm.

It is impossible to reach tall elms with the syringe, and on such trees the printer's ink on a band of paper, or a metallic collar filled with oil, would be successful; or a box set around the base of the tree, with a trough for oil around the top, as was practised in Messrs. Clapp's orchard in Dorchester nearly forty-five years ago. The first set of boxes lasted twenty years; the second set remains still. The boxes cost about thirty-three cents each.

Some maintain that it is best not to battle the canker-worms at all, because that in from five to seven years they will run their course and disappear; while, on the other hand, I am credibly informed that about Dorchester the canker-worm has never failed

to appear in some parts of the town every year for more than fifty years.

The fact that the methods mentioned are effectual, affords one ray of hope for the tree and fruit grower. It would be of lasting benefit if one general application could be made to all sorts of trees infested with the canker-worm, as far as they extend,—for it does not appear to infest all sections alike. It is a strange thing, but yet a fact, that it was not known to reach beyond a certain division wall in one direction, yet ate all before it up to this wall at different intervals within the last hundred years. This instance is related by Mr. Hyde, of Newton. This pest is not of sufficient moment, however, to deter a courageous and vigilant man from planting orchards.

The orchard of our fellow member, T. C. Thurlow, of West Newbury, was devastated for years by the canker-worm, so that little fruit was obtained. By the use of printer's ink, involving an expense of four and one-half cents per tree, a reward followed, the next year, in a crop of nine hundred barrels of number one Baldwins, seven hundred barrels the next year, and fourteen hundred barrels the next year. Thus it seems the trees were determined to make up lost time when once relieved of the enemy that had preyed upon them.

The lesson seems to be, to plant trees and take care of them, and the canker-worm also. The fruit will increase, and the worms decrease, by as intelligent management as is necessary to conduct any business successfully.

The codling-moth is one of the most insidious of our insect foes. Coming, as it ordinarily does, in the moth state at the blossoming of the apple, the same amount of warmth that helps to bring out the apple blossoms also helps to bring out the codling-moth from its winter form in the cocoon. It then lays an egg in the blossom end or eye of the apple, and the worm coming from this eats its way into the apple, causing many to drop prematurely, and defiling many others that do not drop. The worm then comes from the apple and finds its way to crevices in the bark of the tree, or similar protection near by, where it spins for itself a cocoon and prepares for its transformation to a butterfly in the spring. Thus the round of life rolls on for this insect. Man has been obliged to study the life and habits of the insects to find a remedy for the injury they do him. He has found that they go

through certain stages in a season, and all these at his expense for the benefit of their posterity; and thus from year to year they struggle on for life, like all other forms of animal and vegetable life. All appear to be pleasing themselves, but they live really for the perpetuation of their several species. But all apple growers are interested in the prevention of the codling-moth and its progeny, from eating his apples and pears.

We can mention no new remedy, but we must rely on the old means of defence, which would be made more effective by a combined union of forces, so that one man who is trying to rid his own grounds may not be beset on all sides by the unchecked insect enemies of his neighbor, obliging him to keep up the same efforts year after year. We have plenty of examples showing that the continued and systematic application of the old remedies is sufficiently successful to warrant its continuance; and if it is not done, the fruit grower will be outdone.

Gathering and destroying all fallen and worm-eaten apples is one of the first requirements. Swine or sheep running at large in an orchard greatly aid in picking up all wormy apples and in keeping the ground well worked and fertilized, and free from grass. The result of the work of swine in the orchard of Col. E. C. Shirley, in Goffstown, N. H., who communicated with this Society some years ago, was a more vigorous growth of the trees, and a large crop of Baldwins on the odd year, that were very free from worms, and large, fair, and handsome. His orchard is on high land, with a clayey gravel subsoil. His neighbors' apple crops, on the same soil, without this swine culture, were poor, and the fruit wormy.

Trapping is undoubtedly a help in reducing the number of worms so far as they resort to the traps, whether these are straw bands around the trees, or woollen rags or any other substance that affords them a place to transform from the larva to the cocoon state; and it appears to me that a supply of hot water, made transportable, would be a good thing to immerse these shelters in, rather than to destroy the worms by pounding or hand picking, as is usually done. All dead bark should be scraped off the trees to reduce the number of places where the worms can find shelter.

Open fires at night in the garden and orchard are within the means of all, and serve to destroy a great number of winged insects, including the codling-moth, and it would be well to have

fires in all lands contiguous to the orchard, and especially near woods, if there are any in the locality, as many insects that are destructive in the garden, as well as to the forest trees, no doubt make this a refuge. A lantern over a tub of water is one of the most useful traps to attract and drown insects, and a coating of oil on the water would help to destroy them.

The reason why these simple and effectual remedies are not more often applied is, that the gardener or farmer and his assistants, are all tired when night comes. Undoubtedly it would be a paying investment to hire a man for this work of destroying insects alone.

Charles Downing mentions the following as an effectual trap for all sorts of insects in the garden. Fill wide-mouthed bottles half full of a mixture of water, vinegar, and molasses, and suspend them among the trees. In a short time they will be full of insects and must then be emptied and the liquid renewed. An acquaintance of his captured, in this way, more than three bushels of insects in his garden in a season, and preserved it almost entirely free from their ravages.

I have not given any new method of destroying the codling-moth, but still think the old methods would be completely successful if used systematically by all. Partial application of remedies, as has been the past record of warfare against insects, is comparable to a vacuum in air or water, produced by a pressure brought to bear at some special point; as soon as the resistance is taken away the vacant space at once closes up, and no trace is left.

The borer, which is sometimes a serious pest in our young apple trees, can be easily destroyed by cutting away the bark where their chips show, if taken in hand from July to September. Later, when they are deeper in the wood, a flexible wire pushed into the hole will kill them. But better than either is preventing them from getting into the tree, by a strip of tarred paper around the base of the tree, the bottom covered with soil, and the top tied close around the trunk, six or eight inches up. I applied this remedy successfully nearly thirty years ago. A strong solution of soap is also useful to wash the base of the tree to prevent the eggs being laid. It should be applied at intervals from the first of June until August.

The scale louse can be destroyed by an application of raw linseed oil. Crude petroleum is also used effectually, but it must be diluted with water; this can be done by first mixing it with milk, and then diluting with water.

Pear and cherry tree slugs can be destroyed by a dusting with air-slacked lime or plaster of Paris. A sprinkling of dry dust causes them to fall off the tree, and very few are able to return. A spray of London purple and water can be relied upon to destroy them, as it is fatal to all animal life.

There is no better remedy for plant lice than tobacco water.

Tent caterpillars can be easily destroyed by hand picking or the spiral brush, when the worms are in their webs, on a cool day or early in the morning. They can also be prevented by picking their eggs, which are found in glazed masses surrounding the twigs, and burning them. For the last six or more years we, and all in our vicinity, have been almost entirely free from the ravages of the tent caterpillar. I am confident that they were destroyed by a misty rain that congealed and covered every part of the trees with a coating of ice near the hatching season, thus destroying them. Further inland, where the storm was snow instead of rain, they were never more destructive than that same spring, when they disappeared from us.

The system most in use among plum growers for destroying the curculio is to jar off the insects by a sharp blow of a mallet on a limb sawed off for the purpose. Sheets are arranged around the trees, in which the insects are caught, collected, and destroyed. It is quite important, also, to jar all trees where the insects may lodge, in the vicinity of the plum trees. Many have of late planted these trees in hen yards, and it is found that the hens destroy the insects, and cultivate and fertilize the trees, and thus good crops are secured by the plum cultivator, and he may rely upon one every season. This fact is so fully appreciated that the sale of plum trees has greatly increased.

As the subject of currants and other small fruits is to be taken up in a future discussion, I will not refer to them in this paper.

In closing, I would suggest that any effective or new methods of insect destruction that are observed, from time to time, by friends of the Society, be reported at our meetings.

DISCUSSION.

Hon. Marshall P. Wilder said that he who will not take care of his trees, and prevent the ravages of the canker-worm, deserves to have them eaten up. The curculio can be overcome by jarring

the trees suddenly, and destroying the insects that drop; shaking will not do.

Benjamin P. Ware would use the residuum from kerosene oil works, in preference to printers' ink, for destroying canker-worms, as it does not dry so quickly, and it is very much cheaper. Printers' ink should be renewed at least once in three days, but the substance recommended will last at least twice as long.

James P. King had had much experience with the canker-worm, and had tried printers' ink with no avail, but by the application of the residuum of kerosene he destroyed them entirely.

Edmund Hersey thought there is a second brood of codling-moths. In regard to the canker-worm, he thought that if hens were kept in the orchard there would be no trouble from them. He recommended the same remedy for the curculio.

William C. Strong thought the rose-bug is becoming one of the most formidable enemies of plant growers.

Avery P. Slade had had some experience with the rose-bug, and had formerly fought them by hand picking, but latterly had used kerosene in a wash-pan, jarring the insects into it with a small stick.

William H. Hunt had used the method mentioned by Mr. Slade, to destroy rose-bugs. He thought they leave all other grapes for the Clinton, and that if a row of this variety were planted around the vineyard it would protect the vines within.

Mr. Strong thought the *Spiræa sorbifolia* a better trap than the Clinton grape. They can be easily destroyed when on the flowers.

N. B. White thought the rose-bug was destined to become the worst enemy of the fruit grower.

Hon. James J. H. Gregory had an orchard destroyed by using fish oil to kill canker-worms.

Mr. Wilder closed the discussion by recommending caution in the use of oil on trees.

Notice was given that on the next Saturday, Dr. H. P. Walcott would read a paper on "Chrysanthemums and their Culture."

BUSINESS MEETING.

SATURDAY, January 13, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The Secretary read a letter from Winthrop Sargent, of Fishkill-on-the-Hudson, N. Y., acknowledging, in behalf of the family, the resolutions passed by the Society in memory of his father, the late Henry Winthrop Sargent, and thanking the Society therefor. The letter was ordered to be placed on file.

Adjourned to Saturday, January 20.

MEETING FOR DISCUSSION.

CHRYSANTHEMUMS AND THEIR CULTURE.

By Dr. HENRY P. WALCOTT, Cambridge.

The Chrysanthemum family is not only a very large one, but has a distribution over the four quarters of the globe. Only two species, however, are to be the subject of my remarks today, and these two seem only to have been satisfactorily determined by Sabine in 1823. — They are the *Chrysanthemum Indicum* (small) of Linnæus, and the *Chrysanthemum Sinense* (large) of Sabine.

The first named, a small, yellow variety, which was growing in the grounds of the Apothecaries' Botanical Garden at Chelsea, in 1764, appears to have attracted very little notice, and in a few years was lost. This was, no doubt, the type, the varieties of which are known now as Pompon and Liliputian. It was figured as a small, branching plant, eighteen inches high. Beyond Thunberg's mention of the chrysanthemum in the "Flora Japonica" in 1784, nothing more is heard of the plant until 1789, when Blancard, a merchant of Marseilles, imported thirty varieties from China, white, purple, and violet, only one of which, the purple, reached France alive. A year later, this purple variety made its way to England, and was the first large flowering chrysanthemum known in that country. In 1795, it bloomed in Mr. Colvill's nursery, and was pictured in the Botanical Magazine, and seems

to have attracted so much notice that several importations of the plant were made; notably by Sir Abraham Hume and Mr. Reeves. Up to the year 1820, the number of varieties had only increased to twelve. In 1865, according to Mr. Salter, the number was over six hundred.

In 1846, Mr. Fortune brought from China two small flowering varieties known as the Chusan Daisy and *Chrysanthemum minimum*, the last the *Chrysanthemum Indicum* of the Chelsea Garden. They would, perhaps, have shared the fate of their predecessor in England, but were, fortunately, carried to France, where the variety immediately became a great favorite, and, as such, has continued the more popular species to this time. From them came all the Pompons now in cultivation.

In 1862, Mr. Fortune introduced several Japanese varieties, some spotted and striped, others of fantastic forms called dragons,—*laciniatum*—still grown. From this latter date to the present time, the progress of cultivation and improvement has been rapid and decisive.

The origin of the different forms of the flowers lies mainly in the changes undergone by the corollas of the disk- or eye-florets. In the wild form, the ray-florets have strap shaped corollas, and the disk-florets regularly five toothed tubular ones. The principal changes in the florets of the disk are

1. To strap shaped becoming flat from base to tip, and these either incurved or reflexed.
 2. These may be rolled longitudinally either inwards or outwards.
 3. Loose or spreading, attenuated or bifurcated.
 4. As above, but with lacinated petals.
- The subsequent changes retain the tubular corolla,
5. And this short with enlarged teeth (Anemone).
 6. Teeth much enlarged (Dragon).
 7. Tube much enlarged, teeth indistinct (Quilled).
 8. Quilled but open at the mouth, and spoon shaped, a section represented by the Emperor of China.

Seed was first saved in France in 1830, by M. Bernet, at that time, and for many subsequent years, the most successful grower of the country. Of his early seedlings, the two remarkable reflexed flowers, Christine and Chev. Damage, are still grown. He was succeeded by Bonamy, Pelé, and Lebois, who added many fine

varieties, especially Pompons. Seed has been saved by a few growers in England, but I cannot ascertain that anything has been done in this way of late years, though it should always be a spur to the raising of seedlings, even under great difficulties, to know that the variety Prince of Wales is of English origin.

In 1836, an amateur, in Jersey, took up the chrysanthemum, and raised a large number of very fine seedlings, which were sold to Mr. Chandler. These were of the Large Flowered class, and they immediately secured much favor at the English exhibitions. They were more incurved, and of purer colors, than anything previously seen. In 1843, Mr. Salter began the raising of seedling chrysanthemums at his nursery in Versailles, and in 1847 exhibited the Queen of England, still regarded by many as the finest chrysanthemum extant.

In this brief sketch of the history of the chrysanthemum from the year 1764, we may note its development from the ragged, semi-double flower, to that with broader and more compact florets; and this, again, to the reflexed ranunculus form, ending at last in a perfect symmetrical incurved flower, like Prince Alfred. But there is still room for improvement—possibly not in form, but certainly in size and color.

The cultivation of the chrysanthemum begins with the treatment of the flowering plant. This should be at once cut to the level of the ground, at the end of its flowering season. It is necessary that the shoots, which are promptly made from the neck of the plants, should be grown with thorough exposure to light and air. One of the secrets of a good plant in November, is a strong, well colored cutting in March. With the exception of a few late flowering varieties, like Grandiflora, Purple King, and Virginale, the best season for propagation is March. The cuttings should be from three to four inches long, and my habit is to pot them separately, in two and a half inch pots.

They should not be subjected to bottom heat during their root formation, but when this process is fairly completed they should be shifted to five-inch pots. For this potting the soil should be one-half good loam, one-quarter leaf mould, and one-quarter well rotted stable manure. When the plant has reached a growth of from nine to ten inches, I pinch down to four buds, without exception. The young plants should be given a place in a cold frame as soon as possible, and in the third week in May planted

in the open ground in a thoroughly exposed location, and at a distance apart of not less than three feet.

The subsequent care consists in keeping the ground moist and watching carefully for the first serious appearance of mildew, which, in my own garden, almost invariably first appears between the 16th and 31st of August. My final potting is finished by the 12th of September, and the plants are kept in the open air in a sheltered situation until the first severe frost; they then receive the shelter of a cold house. The final potting is made with soil composed of equal portions of rotted sod and stable manure, and, until the buds are on the point of expanding, the plants receive frequent waterings with some strong liquid manure or a solution of some artificial fertilizer.

While I think a much more attractive general show is made by our habit of exhibiting plants covered with an abundance of flowers, there is, also, as little doubt in my mind that the only way in which to secure flowers of the best quality is that pursued by the English growers, which it may be of interest to describe. It must be remembered that incurved flowers only are shown at the great London shows for cut flowers, those with reflexed petals not being admitted, except to separate and distinct classes. Though this rule may appear to be an arbitrary one, it ensures a more agreeable and harmonious impression in small collections.

The largest and most perfect blooms are had from maiden plants; that is, from suckers or cuttings of the year, and not from parts of the old root, inasmuch as the young plant can be kept constantly growing—a vital point,—whereas, the older plant soon becomes exhausted, and fails to give a continuous growth. In the earlier stages of growth, the same soil and treatment as have been directed for the specimen plant are necessary here, except that with these the leader must never be pinched in, but must be allowed its natural growth in order to concentrate the whole vigor of the plant in its main stem. If planted out—which is, undoubtedly, the best practice here—they should be potted by the middle of August, and well staked, removing all laterals as soon as they appear. Before their potting the crown will probably have thrown out two or three leaders, which must not be removed. Constant watering and syringing are necessary from this time on, to remove insects and keep the foliage bright. In September, buds will appear at the ends of the branches; the largest and best

formed of these — generally, but not invariably, the centre one — should be kept; the rest removed at once, without injury to the remaining bud. You will thus have three buds, and, probably, in due season, three remarkable flowers.

The principal disease of the chrysanthemum is the mildew above mentioned. The only remedy is sulphur, thoroughly applied, either in powder or the compound, with quicklime, in water, called Water of Grison. It is made as follows: one pound of sulphur, one pound of quicklime and three quarts of water, are boiled ten minutes in an iron pot. It should stand until it has settled, when the top should be poured off and bottled, and, when used, diluted with one hundred parts of water.

The insect enemies are, first, the green aphid throughout the season; late in the season the black aphid, and all the grasshoppers. In the last year I have lost a number of plants by some root louse, which I have not yet been able to identify. The aphides are to be dealt with by tobacco. The grasshoppers must be picked by hand, and the root louse is still master of the situation.

With regard to the formation of the plant, this is effected by pinching in, and all varieties, so far as growth goes, stand it. To obtain perfection of flower, however, I am satisfied that the Japanese varieties should not be pinched more than once, or the Large Flowered kinds more than twice. The Pompons, on the contrary, may be pinched with safety to any extent, and as late as the middle of August.

As to varieties, what I have to say is the result of my experience in my own garden, the soil of which is a thin, dry, sandy loam, overlying a coarse gravel. The Japanese kinds which have succeeded best with me are the following.

Grandiflora.—Very large, yellow, but rarely in bloom before the 15th of November.

Bouquet Fait.—Rose mixed with white, centre yellow.

Ceres.—Very large; well described by Bernard, producer of it, as of the color of the rose *Souvenir de la Malmaison*.

Dr. Masters.—Long red florets, tipped and spotted yellow, with yellow centre; late.

Elaine.—Pure white; broad petals; full.

Fair Maid of Guernsey.—Pure white; long, ribbon-like petals.

Fulton.—Rich yellow.

La Charmeuse.—Early ; rich purple, tipped white.

M. Délaux.—Very large ; full ; reddish crimson, reverse yellow.

Purple King.—Deep purple ; late.

The Cossack.—Maroon and yellow.

Parasol.—Petals incurved ; chamois colored, edged with gold.

LARGE FLOWERED VARIETIES.—The following is a selection of the best kinds, both for cut blooms and specimens. Many kinds cannot, under any circumstances, be grown for specimen plants—Crimson Velvet, for instance.

The recommendations of the English growers cannot be trusted in this climate. The two most reliable varieties in England appear to be Mrs. George Rundle, pure white ; and its yellow sport, George Glenny ; but though occasionally succeeding here, I do not think a specimen plant can be had oftener than one year in every five. Mr. Clark once exhibited a very fine specimen.

Guernsey Nugget.—Primrose yellow. It can be recommended for its short-jointed growth and general vigor.

Prince of Wales.—Purplish red ; one of the best growers and bloomers.

Mr. Brunlees.—Red, tipped with gold ; also very good.

Jardin des Plantes.—Intense bright yellow ; unique in color, though not a very good grower.

Venus.—Lilac peach.

Dr. Sharp.—Crimson red.

Mrs. Haliburton.—Creamy white.

Annie Salter.—Soft yellow.

Souvenir de Mercedes.—Preëminent in all good qualities except size.

Orange A. Salter.—A good old kind for compact specimen plants.

Of plants that occasionally furnish a good growth, and, with proper care, always a good flower, are the following.

Prince Alfred.—Rosy red ; one of the best blooms in existence.

Princess Teck.—A very large white kind, and

Hero of Stoke Newington, the pink sport from it.

Pink Perfection ; Synonym, Mrs. Mary Morgan.—Rich rose ; a very handsome flower, and the plant possesses good foliage.

Julia Lagravère, velvety red, and

Procne, very bright amaranth, are indispensable in a collection on account of colors, though not good growers.

Felicity.—A cream-colored flower; good both as a specimen and for cut flowers.

POMPONS. *La Vogue*.—Bright yellow with red tips; when opening, it is one of the best.

President.—Reddish rose.

Mr. Astie.—Anemone yellow.

Mdlle. Marthe.—Pure white, and the magnificent golden sport from it,

Golden Mdlle. Marthè.

Salamon.—Cherry red.

Marie Stuart.—Anemone; lilac blush, with light yellow centre.

Eleonore.—Crimson, tipped with gold.

Fanny.—Maroon red.

Rosinante.—Silvery rose, tipped with gold.

Lucrece.—Bronze yellow, delicately fringed.

Although the chrysanthemum is essentially a plant requiring protection to ensure its flowering, a number of varieties have been obtained that will not only flower in September and October, but some even as early as July; and the number of these has, by the efforts of the French growers, much increased in the last few years. The list contains representatives of all these varieties. The earliest flowering are:

Mme. Bachoux.—Lilac.

Petite Marie.—White.

Indicum nanum.—Yellow.

Precocité.—White.

Le Luxembourg.—Dull red.

Bois Duval.

A later flowering section from which I generally obtain flowers in the open air, furnishes of Japanese,

Gloire Rayonnante.—Clear and satiny rose.

Mme. Ch. Desgranges.—White.

POMPONS AND LARGE FLOWERS. *Adonis*.—Cream white, bordered with pink.

Aureole.—Bronze yellow; large flowered.

Capt. Nemo.—Reddish purple, tipped with white.

La Neige.—Pure white.

Dr. Walcott stated that he had had in his collection, first and last, between five and six hundred varieties.

DISCUSSION.

E. W. Wood, who was called on by the President, said that Dr. Walcott had entirely covered the ground, and that any one who followed his directions would be able to bring in exhibition plants. The varieties have increased largely, but more dark, bright colors are wanted. The chrysanthemum has great advantages as a house plant. Ladies desire plants for winter blooming, and run to roses, but it is difficult to cultivate them in the house under the most favorable conditions, and almost impossible under ordinary circumstances. Chrysanthemums may be grown in dwelling houses in all their glory by keeping them in a cool room. The black aphid is as easily destroyed as the green, by removing the plants to a room where they can be fumigated with tobacco. The plants should be kept out-doors as late as possible. Much of the trouble in growing them arises from improper treatment after flowering. Sometimes they are placed under the greenhouse stage without water, or too much water is given, or else improper care or no care is taken of them. Over watering causes the roots to become diseased, and then the cuttings rarely give healthy plants. The speaker would add to Dr. Walcott's selection, the Golden Dragon, a very strong and vigorous Japanese variety, and the Golden Queen, a large Chinese variety, which retains its foliage well. Last year he struck half his cuttings in January and half in March, and those planted the middle of March were better than those planted in midwinter. They were removed to cold frames as early as possible, and planted in the open ground the last week in May. They were not watered at all during the summer. When lifted for potting, a spade was put down at one side, and the plants came up with a mass of roots. When placed in the pots they received a thorough watering, and hardly wilted. He would prefer to take up the plants when perfectly dry. The only difficulty in cultivating chrysanthemums is mildew, and this is a serious one. Some varieties are more liable to it than others, and one side of a plant will sometimes become mildewed when placed next to a mildewed one. Mr. Wood thought we should attempt to get a stock of native seedlings which would be free from mildew.

Joseph Clark had used whale oil soap successfully as a preventive of mildew on the leaves, when growing in the summer.

Edward L. Beard said that the Japanese varieties should not be

nipped as closely as the others; one nipping is enough. Another mistake is leaving them in small pots too long; they need to be grown continuously, and unless they are cannot be grown successfully. If properly nipped they can be flowered much earlier. The black lice are inveterate enemies, and are most troublesome in large gardens. The Japanese varieties are being more generally introduced. At an exhibition in England twenty-five or thirty new varieties, mostly of French and English origin, were shown. Some of the newer ones have the bright vivid colors so much desired.

Mr. Wood said that he did not mean to give the idea that none of the Japanese varieties are early, but only six out of sixteen were ready for exhibition. Discretion is needed in nipping; some varieties do not require it at all; he never nips after the 25th of July.

William C. Strong said the chrysanthemum had been spoken of as eminently fitted for house culture, but it is an objection to it for this purpose that they all bloom at one time; and he asked whether any mode of cultivation would extend the season of bloom through December and January.

Dr. Walcott answered that he had the *Virginalis*, a pure white variety, still in good flower, and also two or three seedlings. But the habit of the chrysanthemum is to bloom in October and November, and, with most varieties, there is no way to avoid it. If the *Guernsey Nugget* is cut down in October, and good suckers are separated and grown in heat in winter, they will flower in May and June. There are varieties which flower in July, and with proper selection we can have chrysanthemums most of the year. He differed from Mr. Wood as to the value of the chrysanthemum for growing in dwellings, but it is valuable for decorating them. He brings them from his greenhouse into the vestibule of his dwelling house, where it is cool, and they last three or four weeks there.

Mr. Wood said that if the *George Peabody* and *Golden George Glenny* are cut down a foot from the ground, each shoot will give a single bloom. Peter Henderson says that if the buds of the Japanese varieties are cut off, so as to prevent them from blooming at the usual time, they will bloom in January.

Dr. Walcott said that his first attempt to raise seed was made seven years ago, and the third season he got all he wanted. There

is no difficulty in raising seed if the house is given up to it. The formation of seed commences in every house, but it is only perfected in a dry atmosphere. The house must be aired thoroughly, and the plants never syringed, but kept dry. To prevent the collection of moisture at the base of the flower, he cuts off the petals. It is difficult to hybridize chrysanthemums, because the bees get the start. The results of his attempts at hybridizing are not encouraging; they are not superior to those obtained from seed not hybridized.

C. M. Hovey said that the chrysanthemum is a good plant for the dwelling house. Attempts have been made to get flowers in winter, and they have occasionally been successful to some extent, but a fine display of flowers cannot be obtained. He knew one gentleman who had two or three kinds at Christmas, and possibly something might be done by retardation. It is the nature of the plant to bloom at a certain season, and it cannot be forced or retarded with much success. Except some of the new varieties, there do not appear to be as many blooming in the open garden as in former years. Forty-five years ago he grew seventy varieties, collected from all sources in this country and Europe. He had twenty-five or thirty kinds from Prince's nursery. The London Horticultural Society gave great attention to the chrysanthemum, and several long articles by Mr. Sabine, the secretary, appeared in their "Transactions" from 1821 to 1826. Pompon varieties were then known. Many of the new varieties are no better than the old ones. The first seedlings were raised from twenty to twenty-five years ago by Salter, in England, and later, by Lemoine and Crouse, in France. The chrysanthemum is an amateur plant, and requires attention at a certain time, which must be given right along, as with the fuchsia. Unless the requisite conditions are complied with, you cannot grow fine specimens and large perfect flowers. He saw at Mr. Henderson's, in New York, a thousand plants in two and a half inch pots, with from three to nine flowers each, the day before Thanksgiving. He had attempted this, but unsuccessfully; the tops ran up too high and the roots run down. The secret of success was in late propagation, the cuttings having been struck the 10th of June. Dr. Walcott saw a plant in England ten feet high, but that cool climate is more favorable to the chrysanthemum than ours.

Dr. Walcott said that the plant referred to by Mr. Hovey was

in the garden of the champion chrysanthemum grower in England. It was ten feet above the level of the pot. The name of the variety was Mme. Ch. Audiguier. In September the buds were an inch in diameter. It was an exceptional plant, with only three buds.

C. M. Atkinson thought that Mr. Hovey had put a lion in the path of cultivators by overstating the care and attention required by chrysanthemums. No other plant gives so great a return for the time and money bestowed on it. It is a thousand times more easily grown than hard wooded plants. It comes at a time when the garden out-doors is stripped of flowers, and tides over a barren season. It is true that almost all of them flower at the same time, but you can get no more out of a plant than there is in it; still there are varieties which may prolong the season, one of which is Ethel, a white variety with a black eye. Not much can be done in retarding them. Mr. Hovey says that nurserymen do not grow them, but in 1881 Mr. Turner, of Slough, raised hundreds of thousands of plants for balcony and in-door decoration. In ten years we shall see a hundred plants sold where we see one now.

Mr. Wood said that the trouble with amateurs is, that they are obliged to purchase plants from nurserymen. The plants should be struck after the middle of March, and kept in cold frames, and not allowed to become pot bound until it is time to put them in the open ground.

Mr. Hovey said that Mr. Wood had expressed his views exactly. The chrysanthemum is a favorite plant with him, and easily grown.

Patrick Norton said that he grows chrysanthemum plants of very small size, because his customers prefer such. Few plants give more satisfaction in city dwellings. The chief point in their cultivation is to give them abundance of water. He propagates early in spring, and again in May; plants them out in June, pinches once or twice, and takes them up in September. He uses a fork to lift them with, and prefers dry weather for that operation, when the soil will shake off from the roots. Last year was exceptionally favorable to their culture.

Hon. Marshall P. Wilder said that the discussion had brought out the real essentials of chrysanthemum culture. They must be grown from good cuttings, and not from little wiry offsets, and kept growing both before and after they are planted out. He knew no plant which affords so good a return with so little labor,

and they come at a time when there are few flowers. No other flower is so good to cut from. He fills every available space in his greenhouse with them. Sulphur, with a little caustic lime, is a sovereign remedy for mildew in chrysanthemums, as well as in grapes.

P. B. Hovey said that Mr. Cowan, gardener to Col. Thomas H. Perkins many years ago, used a pound of sulphur and half a peck of lime for mildew, the sulphur being placed on the lime, slaking them slowly together, which caused the sulphur to unite with the lime. The tub (a half hogshead) was then filled up with water, and a quart of the solution diluted with two or three gallons of water for use. The tub was covered with a blanket while slaking, to keep in the fumes. When the lime settled, the water was left clear but tinged in color by the sulphur.

The President gave notice that, on the next Saturday, William E. Endicott would read a paper on "Lilies, and their Culture."

BUSINESS MEETING.

SATURDAY, January 20, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair. No business being brought before the meeting, it

Adjourned to Saturday, January 27.

MEETING FOR DISCUSSION.

LILIES AND THEIR CULTURE.

By WILLIAM E. ENDICOTT, Canton.

The genus *Lilium* is found throughout nearly the whole of the north temperate zone, and nowhere else, with the exception of the East Indian species, *Neilgherrense*, *Wallichianum*, *Philippinense*, *polyphyllum*, and one or two others, growing, however, at such altitudes as to be in a temperate climate. It is remarkable that the vast plains of Central Asia do not furnish a single species,

although so rich in tulips, fritillarias, and other bulbous plants. There are now known fifty species of lilies with, perhaps, sixty or seventy varieties, so that we have about a hundred and twenty distinct forms of this genus with which to decorate our gardens.

Some of these are, of course, much more beautiful than others, and, without attempting to decide upon matters of taste, we may take it for granted that all will agree that the dull, ochreous reds and yellows of some of the erect flowered species, such as *bulbiferum* and *umbellatum*, are less pleasing than the pure white of the varieties of *longiflorum*, or the brilliant scarlet of *chalcedonicum*.

It is not likely that many new species will be hereafter introduced, yet we may reasonably look for a few when the great peninsula of Corea shall be opened to travellers, as seems likely soon to be the case, and it is by no means improbable that some species, restricted to small and secluded districts, may be discovered by closer search in the longer known countries.

My own experience with lilies has not been extensive enough to warrant me in attempting to instruct this audience upon points of cultivation. I will speak of a few species only, leaving it to others to take up the subject.

The showiest of all lilies is, unquestionably, the *auratum*, and in a garden, a clump of it in bloom is certainly a fine sight. It is not, in my judgment, suited to pot culture, though a strong bulb will do very well the first year; yet I do not find such confined quarters conducive to the maintenance of its health, still less to its increase; the size of its flowers, too, makes it look out of place when so grown. Its proper position, therefore, I think, is out of doors. It is well known that there is a delicacy in the constitution of this species which has been the cause of much disappointment among cultivators. It has been the experience of thousands that the bulbs, after flowering pretty well for a year or two, dwindle away and die, leaving no offsets. I believe that the gardens are few which can show clumps of this lily in perfect health that have occupied their positions five years. I have planted great numbers of these bulbs in soils and positions as different as I could contrive, but all have followed the same road to decay and death, except a lot of six, planted ten years ago in ordinary garden soil, which are now in good condition, except two, one of which had its shoot knocked off three years ago by a hoe in the hands of a careless man and has not flowered since, though there

are several shoots from offsets which started into growth upon the death of the central stem. The other one did very well until two years ago, when the underground shoot of a plant of *Arundo Donax* pierced the centre of the lily bulb. The four remaining, which were planted as single bulbs, send up five or six growths annually, and blossom well. These bulbs have done better than any others of my own or of my neighbors', and I ascribe their success, imperfect as it is, to the fact that they were set, originally, between twelve and fifteen inches below the surface. I have since come to the conclusion that all lilies should be planted deep rather than shallow. To get a sound, strong stock of *L. auratum*, I should depend on home grown bulbs, raised, I mean, from the seed; for such seem better adapted to our climate than Japanese bulbs. The same is the case in England, where such sell from twenty-five to fifty per cent higher than the imported ones. It appears to be necessary, or, at any rate, beneficial, in the case of this and all other species to provide a partial shade for the lower half of the stem. We read in the English papers of *Lilium auratum* eleven feet high, and floriferous in proportion. If anything approaching this has ever been achieved here, it has not come under my notice. A remarkable thing with *L. auratum* is its variability in the time of flowering. In my own garden I have bulbs in flower frequently in June, in September and in the intervening months, and, stranger still, the plant which flowered early, one year, will frequently come into bloom late, the next.

The most beautiful lilies, in my opinion, are those belonging to the sub-genus, *Eulirion*; what we may call the *Longiflorum* section. These are mostly white lilies, various in shading and form, such as *longiflorum* and its varieties, *Wallichianum*, *Neilgherrense*, *Philippinense*, etc. The best known of this group are *candidum* and *longiflorum*, so much grown for florists' use. *Candidum* is one of the oldest garden lilies, and, take it all in all, the finest, in my opinion. It likes a moderately moist, moderately rich soil. If it has this it will grow to perfection with exceedingly little care. It is the only lily which I have cultivated that has ever been injured by insects. Three years ago, when my bulbs of this species were about to blossom, the buds, instead of opening, seemed to hesitate a day, as if to make up their minds, and then decided it unanimously in the negative, withered and drooped. An examination showed that each stalk was pierced a few inches below the

lowest bud with a hole as large as a knitting needle, and I found that a grub had eaten its way up the middle of each stalk, devouring the pith as it went. I killed every one of them, and have not been troubled since.

Lilium longiflorum is marked in some catalogues as not being hardy. I was deceived by this for a long time, and I speak of it now because there may be some here who do not know how incorrect the statement is. I hardly need say that *Lilium longiflorum* will endure any winter we are likely to have in this latitude, provided it is planted in a soil light rather than heavy. In my hybridizing experiments, I have not found it easy to induce this species to set seed, though I have tried it with pollen of *Philadelphicum*, *Canadense*, *superbum*, and others. The opposite fertilization is easy, all the last named species forming abundance of seed when treated with the *longiflorum* pollen. I say nothing of forcing this species and *candidum*, for I have never had any experience, but perhaps those who make a business of it will pardon me if I make a suggestion. A lily deprived of its anthers is deprived of all expression and character, and of nearly all beauty; why not find some means of keeping the pollen inside of the anther, and so present the lily in all its unmutated loveliness. I believe that some way could be found to accomplish this, without much trouble.

Our native lilies—those of the eastern States—vary to a considerable degree, and the finest forms are very beautiful, and well repay the trouble of getting and caring for them. The *Lilium Philadelphicum* is often found of a dull red; but sometimes, and not rarely, its color is exceedingly pure and intense. The finest flowers I have seen of this kind grew in a little open place in the woods of New Ipswich, in southern New Hampshire. The species is very abundant in southern Maine, and the flowers may be seen by thousands on both sides of the railroad between Portsmouth and Portland. I have never seen more than five flowers on a stem, though I have heard of as many as nine. *L. superbum*, so abundant in southeastern Massachusetts, is well named. Its pyramids of flowers of various shades of scarlet and crimson, mixed with yellow and spotted with brown, make it truly superb. This species requires more dampness in the soil than most kinds.

Lilium Canadense is the most common kind in most parts of New England, and varies quite widely in regard to height, depth of color, degree of spotting, breadth of petal, etc. The best

forms are hardly surpassed by any of the colored lilies. I often think of a plant of this which I once found, as illustrating how little we know of the possibilities of any species of plant. *L. Canadense*, as we usually see it, has one, two, or three flowers. Fine specimens have from five to seven, and a stalk bearing from nine to twelve flowers would be regarded, I suppose, as something quite out of the common growth, as indeed it would be; but the astonishing specimen I speak of had a pyramid of twenty-two expanded flowers and three buds, upon a stalk seven feet high and an inch in diameter. And this was not the result of cultivation; it was unaided nature, taking advantage of unusually favorable conditions. The plant grew in the gravel of a railroad embankment, which ran down into water. It thus had an exceedingly porous soil, with an abundant supply of water brought up by capillary attraction.

I spoke in the beginning of this paper of the possible finding of new species. We cannot go to Corea or India to look for them, but we have as good a chance of finding them here in Massachusetts; and, better and more gratifying still, what we find here may be of our own creating. Though we know, by the experience of Mr. Parkman, that the chance of getting a good thing by hybridizing is not one in a thousand, yet the same experience shows us that successes are possible which may outweigh the nine hundred and ninety-nine failures a hundred times, for *Lilium Parkmanni* is equal to any lily known. What a beautiful thing might result from a combination of *longiflorum* and *Canadense*, of *candidum* and *Philadelphicum*, of *auratum* and *chalcedonicum*; and how immeasurably easier to tend a thousand or ten thousand seedlings in your own garden than to search for rarities among savage men, ferocious beasts, venomous reptiles and miasmatic swamps, enduring pestilence, cold, heat, hunger and thirst.

Nor is it certain that hybridization must be confined to crossing a lily with some other lily. Different genera among other families are not unknown to have been successfully crossed. Colonel Wilder has experimented in the use of *Gloriosa* as one parent with some species of *Lilium* as the other, and the genera *Littonia* and *Sandersonia* appear to be as well adapted to such use. It is in hybridization that a real flower lover will find his greatest pleasure.

DISCUSSION.

Charles M. Hovey was called upon as having had much experience with lilies, and said that it was a subject of great interest to him. He had devoted much attention to the genus, beginning with *Lilium lancifolium*, about 1841, and as early as 1844 attempted to hybridize it, producing the variety Melpomene; and the beautiful seedling which surpasses even *L. auratum*. He had paid but little attention to native lilies. If he could have but one lily he would take *lancifolium*. This species is one of the hardiest as well as the most beautiful. He thought the trumpet-shaped lilies are spoiled by impregnation with the other species. He made twelve different crosses of various lilies including *candidum* and *longiflorum*, but the seedlings had the petals all slit into narrow pieces, and he gave it up and confined himself to *lancifolium* with *auratum*, *punctatum*, *superbum*, etc. He could see a difference in the seedlings which would not be noticed by an untrained eye, and had selected nine varieties, varying in the size or breadth of petals, intensity of color, number and size of spots, etc. He could not say that *L. longiflorum* is as hardy as some of the other lilies, as his own bed had suffered; but this may have arisen from a combination of causes. He had had bulbs of *lancifolium* survive the winter lying on the ground. *Lilium auratum* is, practically, a failure here. He saw the stem of a plant, out of bloom, at Weybridge, England, eleven feet high. It was in a rhododendron bed. He had planted several bulbs in a rhododendron bed, with peaty soil, and they had flourished, and he hoped for further improvement. It seems to be very particular as to soil and situation; millions of the bulbs have been imported from Japan, but a small part of which survive. He thought *L. Parkmanni* did not propagate rapidly, but partook of the character of *L. auratum*.

Mr. Hovey spoke of the beauty of our native lilies, but said that on Cape Cod, where he had seen *L. superbum* with eighteen flowers, they were never cultivated, though around almost every farm house you would see tiger lilies. He had never found *Philadelphicum* with more than three or four flowers; bulbs the size of a pea will flower. The finest he had ever seen were where the ground had been burnt over. He agreed with Mr. Endicott, that the lily might be hybridized with other genera. If we could get a *lancifolium* of a bright yellow, or straw color, it would be a great

acquisition. Crossing with *superbum* would not do it. *Lancifolium album* fertilized with *tigrinum*, produced a beautifully spotted flower. Lilies are very peculiar in regard to impregnating, and great caution is required to see that they have not already been self-fertilized. The petals are closed in on the stamens, and the flowers must be opened early and the stamens cut away. Mr. Hovey thought that all lilies should be planted about five inches deep, and protected with a few leaves. The soil should be well drained, and not too heavy; for *L. candidum*, it may be stronger and richer. Charles A. Putnam, of Salem, who has been very successful in cultivating lilies, gives all his lilies a liberal dressing of peat every year to great advantage.

Mr. Endicott said, in regard to Mr. Hovey's doubt whether the *Lilium longiflorum* is quite hardy, that it grows naturally in a warmer climate than any other we cultivate, and if the shoot is caught above ground it has not the power of resisting cold. He takes up his bulbs and keeps them out of ground until November to prevent them from starting. In answer to an inquiry how often other lilies should be transplanted, Mr. Endicott said, that, excepting the *longiflorum*, he allows them to remain an indefinite period.

William Falconer, of the Cambridge Botanic Garden, said there were two species which he wished to add to those mentioned, namely: the little Siberian *pulchellum*, and *temuifolium*. They germinate in eight or ten days, and flower when two years old from seed. He had found *longiflorum* hardy; the little bulblets on the stems, when removed and planted, flower in two or three years. He saw *Melpomene* in England, a few months ago, where it was regarded as the most beautiful of all the *speciosum* lilies. *L. Hoveyi* is as good as *Parkmanni*, and not so hard to propagate.

Mr. Hovey said that tiger lilies will stand ten years without transplanting; *L. candidum* four or five years, and *L. lancifolium* two or three years; but he takes up all his lilies every year. He had seen tiger lilies, in the garden of a friend, seven feet high, in sandy soil on Cape Cod. *Lilium superbum* improves by being let alone. The seed of *L. Canadense* will lie in the ground for many years. They grew naturally in his nursery, which was cleared up in 1841; and two years ago some lilies came up there, where they had not been seen before for thirty or forty years, which he could only account for on the supposition that the seed or scales had remained in the ground for that length of time. *Lilium Harrisii*

was shown at Philadelphia with from three to six flowers, and *L. floribunda* with twenty flowers on a stem. A lily from Bermuda, supposed to be the same as *Harrisii*, was exhibited before the New York Horticultural Society, with one hundred flowers on a single stem. Bulbs not larger than a pea will flower the next summer. How it came to Bermuda, and why it was not introduced here before, is a matter of curiosity and surprise.

William C. Strong recalled Mr. Hovey's experiments in hybridizing *Lilium lancifolium* many years ago. His beds of seedlings were remarkable examples of success. The *longiflorum*, and similar species, are, however, more practically useful to the florist than *lancifolium*. He had grown *L. candidum* under glass as easily as potatoes, and by the bushel. The bulbs were planted thickly in the border, and produced six, eight, or ten flowers each on stalks five and six feet high, with no sign of disease. Perfect bulbs were produced on the stems, owing to the uniform humidity of the atmosphere. This species is subject to blight, which appears as if caused by a fungus before blooming. He was at E. M. Wood's greenhouse in Natick the day before, and saw thousands of vigorous plants of *L. Harrisii*. There was a bank in flower of plants eighteen inches high, in pots, and as strong as *L. longiflorum*. These were from bulbs the size of a pea; every little scale produces a bulb, and yet this small size flowers abundantly, and it looks as if it would displace *L. longiflorum* for florists' purposes, unless the size be too large.

Warren H. Manning had cultivated sixty species and varieties of lilies. *L. Humboldti*, a Californian species, grew three or four feet high, and produced eight flowers. *L. Thunbergianum*, or *elegans*, is of a dull color, but the easiest of all to grow. They are good in mixed borders, as they flower low down, and make a brilliant display. He had seen *L. Canadense* with the leaves both in whorls and alternate, and some stems with thirteen or fourteen flowers each, on the edge of a meadow where the soil was moist, but the water would not settle. *L. superbum* increases rapidly, and flowers in almost every soil. He had seen but little difference in the varieties of *L. longiflorum*. His only success in hybridizing had been with the immature flowers of *L. Pyrenaicum*, having only the stamens visible, which he hybridized with *L. Canadense*, and obtained seed.

James Cartwright said that his experience with the *Lilium*

auratum had been like that of the essayist. He had one row where all the bulbs died but one, which had eleven blooms; he took this up and made two of it, and now has a dozen from it. It can be propagated by scales in moss or sand.

Mr. Hovey thought the blight on *Lilium candidum* was local, and caused by peculiar weather at a particular season of the year. Two or three years ago, a rain storm of three or four days came when his *lancifoliums* were about to bloom, and they also were affected. He did not think it a fungus, though fungus might be engendered.

President Hayes spoke of the great number of the *Lilium superbum* on the line of the Old Colony Railroad, which so fascinated him with their beauty, that he had a quantity of the bulbs collected and planted them in beds prepared with peat, and they have grown superbly. No lily is more beautiful, and it is desirable to use all means to extend its cultivation. He thought it a thing to be proud of that one of our members has, with his own hands, produced the finest lily in the world.

Mrs. H. L. T. Wolcott said she found *Lilium superbum* growing on a dry hill in Taunton, and collected a quantity of the dry bulbs and planted them in similar soil, but two which she put in lower and moister soil, did much better, and [she wondered if all would not have done better there.

Mr. Hovey said that about eight or ten years ago, he was told that *Lilium superbum* grew abundantly on the line of the Old Colony Railroad, and he contrived to get a dozen from among the roots of trees, where a trowel was of but little use. This was in a depression covered with water in the winter. He found them at Bristol, R. I., and Marion, Mass., under the same circumstances, but never saw them on high land.

F. L. Temple, spoke of a remarkable specimen of *Nyssa multiflora*, or Tupelo tree, two feet in diameter, forty-five feet high, and of equal spread. It has no branches until within seven or eight feet from the top, when they come down like a Kilmarnock willow, forming a great hollow dome. This form is not the result of pruning, as suckers from it take the same form. Professor Gray, and Mr. Dawson of the Arnold Arboretum, thought it a remarkable tree.

J. W. Manning said he had known this tree for twenty years. It

stands in a pasture on the Malden Poor Farm. Mr. Stiles, who formerly had charge of the farm, took up the bushes around the tree and pruned it up, and it had the effect of adding to the vigor of the tree and spreading the top, so that the ends of the branches drooped. The speaker had thought of getting the tree photographed.

Charles M. Hovey said that the tupelo tree is not very common. There are three or four in Cambridge, some of them from sixty to one hundred years old. They have round, umbrella shaped heads. Mr. Flagg says that the growth is sometimes upright and sometimes round, or umbrella shaped. Mr. Hovey has a tree twenty-five feet high, which he raised from seed in 1862. The tupelo is a very beautiful tree but somewhat difficult to propagate and transplant.

The subject was referred to the Committee on Large or Interesting Trees.

It was announced that on the next Saturday, the subject would be "The Best Kinds of Fruits for Export," to be opened by E. W. Wood, Chairman of the Fruit Committee.

BUSINESS MEETING.

SATURDAY, January 27, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The Annual Report of the Committee of Arrangements was read by the Secretary, accepted, and referred to the Committee on Publication.

Adjourned to Saturday, February 3.

MEETING FOR DISCUSSION.

THE BEST KINDS OF FRUIT FOR EXPORT.

E. W. Wood, Chairman of the Fruit Committee, was appointed to open the subject, and said that fruit was commonly looked upon

as an article of luxury and for domestic use, but the question of today presents it in a different light. Small fruits are not yet exported in a fresh state, but the speaker thought that grapes, both out-door and from under glass, might be raised successfully and profitably for export. We need an out-door grape that can be depended on; at present the Concord is the most reliable, but it is a total failure one year out of five. Whether Moore's Early will fill the place remains to be seen, but it has been tested eight or ten years, and seems to be the thing needed to give a sure crop in different soils and locations. Mr. Wood thought we could grow hot-house grapes successfully to export. There is an impression that it costs a great deal to grow grapes under glass, but it can be done very cheaply in a cheap house where the vines are planted on the outside. Where it is possible, the back of the house should be placed against a building or fence. If one has such a location, he needs only to put the glass in place to have a house. The wider the house is, the better. The border need not be more expensive than a flower or rose bed, and once made will last a long time. The vines will require little more care than Concord; they should be pinched from two to six times. The question is one of facilities, expense, and demand. Few grapes are raised in Europe in cold houses; fire heat is given in spring and autumn at least. Here we have plenty of sunlight, but we need something to lengthen the season, and this is supplied by a house without fire heat, which will enable us to grow grapes for exportation successfully. In England they grow enormous bunches, but size is gained at the expense of quality. Robert Watt, well known here as a successful cultivator of grapes under glass, had a visit from a brother Scotchman, also an expert in grape culture, to whom he gave a bunch of Black Hamburgs, weighing not over half a pound, without telling him the variety, and so superior was the flavor imparted to it by our bright, warm suns, that he took it for a new variety, and thought it the finest he had ever tasted. In England they have not so much sun in August and September as we have, to give quality.

There is no reason why we cannot grow pears for export. The blight, which was the only enemy, is now disappearing. The pear is the most reliable of all fruits for an annual crop, and there is no difficulty in transporting late varieties like the Beurre Bosc, Seckel, Doyenne du Comice, Duchesse d'Angouleme, Beurre d'Anjou,

and Dana's Hovey. Few persons would grow a greater number of varieties for sale here.

It has been shown conclusively that there are no better apples for export than those raised here. Canadian buyers have been in our market lately, buying up all that could be found. The demand is so general that there is no such thing as glutting the market, and it relieves us of a surplus which, in some years, has made the apple crop a nuisance. Last year was the bearing year, but the crop was small, yet large enough to glut the market, but for the demand for export. The export trade has grown up in the last ten years; it was begun by New York growers. In 1878, 300,000 barrels were exported; and in 1880, 1,400,000 barrels. Last year not so many were exported, because they were not to be had. We have passed the time of glut. Probably nine-tenths of the apples exported are Baldwins. One can hardly make a mistake in planting or grafting this variety. It grows vigorously, bears early, is of good size and quality, and as a keeper is second only to the Roxbury Russet, and it is at home here in its native State. It is remarkable that the four or five best apples for exportation are all natives of New England, and several of them of Massachusetts. Growers in this State have the advantage of being located near the best shipping port. There are thousands of acres suitable for orchards within twenty miles of Boston, which can be bought for fifty dollars per acre. The best land is not required; springy hill-sides, and rocky land, if you can get the plough into it, make excellent orchard sites. On southern hill-slopes the trees present their tops to the light and air, which give color and beauty to the fruit.

Some object that it takes too long for apple orchards to come into bearing; but when the speaker was thirteen years old, he persuaded his father to plant some apple trees, and assisted him to do it, and a neighbor who passed, said they were doing a good work for the boy; but, though the trees had a life and death struggle with the cattle, his father lived to pick from ten to fifteen bushels from each tree. The speaker knew an orchard of a hundred trees in Brookline, which bore one hundred and twelve bushels the eighth year. The ground between young apple trees is not lost, for three times as many peach trees may be set between them, which will have room for eight or ten years, and, if as productive as for the last few years, will pay for the cultivation of the whole.

Mr. Wood said he would make an effort to cause his trees to bear fruit in the odd year, and quoted Mr. Wilder as having said it is settled that this can be done. The speaker said he had two small trees which he grafted with Hubbardston Nonsuch, from an even year tree. In four years they showed blossoms on the even year; these were plucked off, and the next year they bore a small quantity of fruit. The third year all the blossoms were removed again, and the fourth year they gave all the fruit he wanted. The next year they did not blossom, and now they bear regularly on the odd year.

Another phase of apple exportation is in the evaporated form. These are most popular, bringing eighteen cents per pound when ordinary dried apples command but seven cents. The entire crop, or only the fallen and bruised apples, may be used in this way. It is more important away from the seaports than here, and in the west is carried on on a large scale.

Charles F. Curtis, gave an account of the method of selling apples in England. This is wholly by auction, though they may be consigned to some dealer there. There are five auctioneers in the business in Liverpool, and all the apples received are sold by one of them. The sale is held in a large amphitheatre, in the centre of which is a large table, on which a barrel of apples of each mark is poured out as a sample. The five auctioneers sell in rotation, each one three-quarters of an hour at a time. The first catalogue may include oranges, nuts, raisins, etc. The first auctioneer must step down when his time has expired, and the next one may have apples. If one sells out his list before his time is out, the remainder is divided among the others. The sale continues, if necessary, until ten o'clock at night. Each sample of apples represents twenty barrels, in which quantity they are sold. If a barrel turns out better than the sample, the purchaser gets the advantage; if it is poorer, he must bear the loss. After the others are disposed of, the sample is sold; if the others have brought twenty-five shillings and sixpence, the sample will probably bring twenty-two shillings. The understanding is that the apples shall be perfectly tight in the barrel; when such bring twenty-five shillings per barrel, "shakers," or those settled half an inch in the barrel, owing to slack packing, will bring four shillings less. The next grade is "wet and wasty," which bring only half the price of the best. The Baldwin is the only variety sold to any

amount; probably from seventy-five to eighty per cent are of that variety. It is a universal bearer, and the only one which can be supplied in sufficient quantity to send a thousand or two barrels. Retail lots and odds and ends are not wanted. Sometimes all the apples sold are not delivered; if not landed in time, the sale is void. The sales are held three times in a week. The extensive export of apples dates from the time when it became apparent that New England could raise all the apples needed there for home consumption. Then the New York growers began to ship to Europe; this was about ten years ago. Last year there was not so much surplus as in some years. Some of our apples are sold as Canadian apples. The speaker supposed that some dealers in Liverpool received apples directly from the exporters here to sell, but he filled an order from one of the largest dealers here, and the day after they were received they were sold at auction. Apples for export should be packed well. High colored and medium sized specimens should be selected and placed in the bottom of the barrel, as closely as possible, and with the stems all down; the barrel should then be filled up, being shaken as often as a basket full is put in. It should be filled half an inch above the chimes, and the head pressed in by means of a screw. The barrel is then turned over and marked on the faced head, so that when opened it shows an even and uniform surface. Apples thus faced will bring from twenty-five to fifty cents per barrel more than those not faced. There is very little demand for sweet apples. Apples are sometimes shipped successfully in warm weather, when later shipments in cooler weather will decay. Sometimes a cheap grade brings a proportionally higher price than the first quality.

Leander Wetherell said he had heard of the middle of a barrel being filled up with inferior apples, or with a pumpkin.

Mr. Curtis said that such things did sometimes happen.

Mr. Wetherell had known of apples being sold here to dealers from Canada, and shipped directly to Liverpool as Canadian apples.

J. W. Manning spoke of a young man who went to Kansas during the exciting times about twenty-five years ago, and who now has an orchard which he raised from seed, and from which he gathered in one year ten thousand bushels of apples, which netted him forty cents per bushel. People come with teams from all the country round to get them.

O. B. Hadwen said that he planted the seeds of his orchard in

1843, and had set out twenty acres, which he has watched from seed to maturity. He felt considerable enthusiasm then, and told his wife that the profit of the orchard would pay their expenses when they were old, but ideas of living have changed, and it does not. Nevertheless, he felt like encouraging the planting of orchards, for he believed that there is a better prospect ahead for them than in past years. Mr. Gold, the Secretary of the Connecticut Board of Agriculture, told him that all the apples in the eastern part of that State, last year, were sold to a firm on Long Island, who furnished boxes, and paid one dollar per box for everything over two inches in diameter. They were used for canning and evaporation, and the cores and skins for cider and jelly, so that nothing was wasted. This manufacture opens an opportunity for a very large traffic.

John B. Moore confirmed what the Chairman of the Fruit Committee had said as to the adaptation of the soil of Massachusetts to apple culture. There can be no doubt that it is one of the best. The seedlings originated here prove it. Such varieties as the Baldwin, Hubbardston Nonsuch, Foundling, Williams's Favorite, Sutton Beauty, Danvers Winter Sweet, Leicester Sweet, Hunt Russet, Garden Royal, and others, would only have been produced on a soil favorable to the apple. No other State can show such a record in regard to apples of established reputation. Rocky hillsides, and land unfit for other crops will produce the best quality of apples, and we have the best facilities for shipment, for Boston is one day nearer Europe than New York, and this may make the difference between profit and loss. If he were a young man he would plant apple trees. For exportation, apples must be grown better than heretofore. Farmers fail in sorting and packing, though the dealers are partly to blame for this. He knew an orchard in Middlesex County, where the owner did not wish to assort the fruit, and sold it to a dealer in a lot. The directions of the dealer in regard to packing were to put a large basket of good fruit in the bottom of the barrel, then a basket of the poorest, and then fill up with good. These would do better to send coastwise than to foreign markets. There is an evaporator at work, successfully, in Littleton, and this use of apples will prevent their being sold for a dollar a barrel.

D. W. Lothrop said that the Roxbury Russet has been very popular, but it is rather difficult to grow, and he thought it was

waning in reputation. There are two other important russet apples which are probably eligible varieties for export, — the Red Russet and the Hunt Russet. The Red Russet was found by Mr. Cole to keep as late as the Roxbury; the flesh is firm, and the tree is more vigorous than the Roxbury, and the crop may bring more money. The Hunt Russet is exceedingly fine; Mr. Cole thought it the best in quality of all the russets. The speaker had known a barrel of fine specimens sold for ten dollars, and they almost always bring five dollars. The Red Russet is not as good a table apple, and he had regrafted his with the Hunt Russet, which is fair and keeps well, and will probably bring more money than either the Red or Roxbury Russet. The Baldwin, Roxbury Russet, and Rhode Island Greening have heretofore formed a kind of trinity, which has held together for a great length of time. The Snow apple is of exceedingly fine quality, and is raised in great quantities in Canada; and though not late keeping, perhaps ought not to be overlooked by the exporter. The Hubbardston Nonsuch will keep till February, but then becomes rather mealy. The New York Spitzenberg is very fine, but whether it could compete with the russets is rather doubtful.

Mr. Hadwen said that the Snow apple will succeed only on limy soils.

Leander Wetherell quoted from the Report of the Commissioner of Agriculture in Canada West, in regard to apples the most approved for general cultivation there. The Baldwin is one of the most popular. The only objection to the Rhode Island Greening is its color. The Esopus Spitzenberg was favorably spoken of. The Golden Russet is good, and the Roxbury Russet the longest keeper. The Ribston Pippin is a shy bearer. The Red Canada (known here as Old Red Nonsuch) is a long keeper. The Swasey is small, but delicious; of a handsome cinnamon russet, and the tree is vigorous. It has brought twenty-five dollars per barrel in London. The Snow apple has spotted badly; it is red, with very white flesh. The King of Tompkins County was well spoken of. The Newtown Pippin brings the highest price in the London market, but has suffered from other varieties having been sold under that name. Mr. Pell had grown an orchard of this variety on the Hudson River, and shipped the fruit for years. Tloman's Sweet is very good. Colored apples are more popular than those not colored; perhaps the Williams's Favorite is the highest colored of all, but the quality is not extra.

Mr. Curtis said that out of five or six barrels of the Snow apple, perhaps only two would be free from black spots, and the Esopus Spitzenberg the same; otherwise they would sell for more than Baldwins. The Snow is too tender fleshed for exportation.

Mr. Wood thought it important to place the Society on record correctly. There is no doubt that the apples originated here grow best, and are most profitable here. Though the Newtown Pippin once brought a higher price in London than any other apple, today the Baldwin will bring more than the Newtown Pippin.

President Hayes spoke of a gentleman who sold a hundred barrels of Hunt Russets for five dollars per barrel.

Mr. Wetherell said that he had grafted most of his apple trees with Baldwin. He got grafts, from the late James Eustis, of "odd year" Baldwins, which seemed to perpetuate the habit.

William H. Hunt said that he lives on the farm where the Hunt Russet originated. The farm has been occupied and inherited by the family since 1635. His father, who died a few years ago at the age of seventy-five, did not know when the variety originated. If more extensively cultivated, it would make a fine shipping apple. The tree is more hardy than the Baldwin, being never winter-killed, while the Baldwins were destroyed in 1832, and again in 1857. The Baldwin is hardy on high ground, but not on low. The Hunt Russet is of fine quality, spicy, and a good bearer and keeper, but a little subject to be knurly. The cider made from it is superior to that made from the Baldwin. A Baldwin apple may freeze a little without injury, but a Hunt Russet may freeze quite hard and not hurt. The Hunt Russet is not as large as the Baldwin.

Mr. Hunt said that his experience in buying fruit while travelling in Europe, is that it is ordinarily not so good as in the markets of America. He saw fine apples in France and Germany, but they were scarce, though there were many inferior cider apples. The Beurre d'Anjou pear was of fine appearance, but it did not come up to the quality of pears here, being coarse and rough. In Italy, he was surprised that the oranges were not sweeter; excepting the Mandarin oranges, they were not superior to those brought here from Europe.

Benjamin G. Smith, said a word of encouragement to plant orchards. A relative of his, at the South Shore, planted an orchard at the age of sixty-five, and lived to be eighty-five.

Mr. Curtis, in answer to an inquiry, said that he did not think

cold storage would keep apples a month later than ordinary, and a great disadvantage is that they must be used as soon as they are taken out. Years ago his firm had three or four thousand barrels of Roxbury Russets stored every year to put on the market late in the season. Now very few are stored, owing to the improvement in early southern apples, which formerly were shaken off and raked up, but now are gathered and packed properly. Since the war, many Jersey farmers have gone south and improved the quality of the fruit and vegetables grown for market. The apples ripening in May are known as May apples, and those ripening in June as June apples.

Benjamin P. Ware gave an account of a fruit evaporating factory in Georgetown, Mass., which he had examined. The fruit purchased is largely windfalls, and the quantity is ascertained by weighing the loads. The apples are first pared and cored with machines worked by boys and girls, and then placed in drawers of lattice work, through which a current of air heated by a coal fire is made to pass. The beautiful whiteness is caused by placing them in a sulphur bath before they are evaporated, which not only whitens them but closes the pores so that they remain white. This part of the work is very disagreeable to those engaged in it. The price paid for windfall apples is from fifteen to twenty-five cents per bushel. The refuse of the apples is grated and made into cider. The factory is quite profitable, and affords an outlet for the surplus of apples raised in the neighborhood. Squashes are also evaporated there. Mr. Ware thought it evident that the demand for apples is going to be unlimited, and as many old orchards are going to decay, and few new ones are planted, unless a change takes place the supply of home grown apples will not equal the demand.

The Chairman of the Committee on Discussion announced that on the next Saturday Dr. James R. Nichols would speak on the "Use of Artificial Manures in Horticultural Work."

BUSINESS MEETING.

SATURDAY, February 3, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The President, as Chairman of the Executive Committee, reported the appointment of George W. Fowle as Treasurer of the Society and Superintendent of the Building, and Robert Manning as Secretary and Librarian, for the year 1883.

The Annual Report of the Treasurer was presented by him, and read by the Secretary, accepted, and referred to the Committee on Publication.

The following named persons, having been recommended by the Executive Committee, were on ballot duly elected members of the Society.

WILLIAM O. GROVER, of Boston.

ARTHUR H. FEWKES, of Newton Highlands.

ELI A. SAWTELLE, of Boston.

Adjourned to Saturday, February 10.

MEETING FOR DISCUSSION.

The following paper was read by the author, who remarked that though his subject differed from that announced by the Committee, he should make the latter incidental to that which he had chosen.

THE SWEET PRINCIPLE OF FRUITS AND PLANTS.

By DR. JAMES R. NICHOLS, Haverhill.

The most interesting phenomenon connected with the growth of fruits and vegetables, is the development in their structures of chemical principles which influence in a peculiar manner the sense of taste. A variety of impressions are produced upon the nerves of taste, some of which are agreeable, and others disagreeable, by bringing in contact the juices of certain fruits, roots, grasses, leaves, etc., in their mature and fresh condition. The sense of sweetness is usually agreeable, while the sour and the bitter are of the opposite character.

The term sweet is applied to a class of bodies which are found

in fruits, and in a considerable number of vegetable structures, but we do not clearly understand *how* they are capable of exerting so decided and pleasurable an influence upon the palate, not only of human beings, but upon animals as well. As we walk through our gardens and orchards, and watch the growth of the luxuriant products of the soil, we do not often stop to consider the intricate and wonderful chemical reactions which are unceasingly taking place in everything that springs from the earth upon which we tread. We place the luscious ripened fruits upon our tables, and partake of them with deep sensual gratification, but we do not often consider the origin and nature of the complex agents which render them so acceptable.

The sense of taste is in some respects the most mysterious and wonderful of all the senses. If the sense of touch is, as seems probable, the parent sense, or the primal avenue through which mind was able to assert itself, it must be that taste was the next most necessary sense for man's elevation and protection. All we know about it chemically or physiologically, is that a delicate network of nerves ramifies through the tissues of the tongue, and in surrounding or adjacent parts, and that they have the functional duty to perform of conveying to the "central office,"—the brain,—sensations as regards the nature of what is brought in contact. If we examine into the chemical or physical character of these nerves, we do not find that they are in the slightest respect different from the optic or auditory nerves which transmit sensations so absolutely unlike. They are the same in color, structure, and chemical constitution; but how different their office! Nature has fixed limits to our fields of investigation, and however anxiously we may inquire, we cannot take a single step over the boundary line which divides the known from the unknowable. We must content ourselves, therefore, with the act of bringing substances in contact with the little telephonic nerve conductors of the mouth, and permit them to inform the interior man, whether they are noxious, or innocuous, agreeable or disagreeable, and not ask *how* the messages are conveyed.

Substances characterized by sweetness, are assumed to contain an organic product called sugar, and, as a class, vegetable structures do contain it in some one of its forms. There are, however, a few substances which have a sweet taste not due to sugar. Acetate of lead is an example afforded in the mineral world, and glycerine is a sweet liquid, the base of fatty acid com-

pounds having no sugar. There is a form called *hepatic* sugar, which is a product of the liver, and some of the secretions of the body contain it. It is, however, in the organic world that we find sugar in the vast quantities needed by man, and in the juices of fruits and plants we find its hiding place.

Before vegetable physiology and chemistry were understood, the belief prevailed that all the characteristic constituents of fruits and plants were in some way hunted from the soil, and conveyed to their resting places by the sap, which was known to circulate through living vegetable organisms. Although no sugar could be detected in any soil by the most persistent scrutiny, yet it was supposed that sugar, and its associated acid and other plant constituents, were present, and ready for transportation by the ascending sap. We are disposed to smile at this error of our fathers, but we should remember that, in accounting for natural phenomena, or seeking for a reason for things, the easiest and shortest path is the one usually followed. This remains true until we are guided by facts learned from accurate observation and experiment, or until science becomes sufficiently robust to act as an unerring guide.

Science, in our epoch, is capable of explaining many of the former mysteries of plant movements and plant production, and we now know the source of the sweet principle of fruits and plants, —we know that the soil has no direct agency in supplying sugar to any organic structure.

Sugar is a very remarkable substance, and its investigation opens to view surprises and paradoxes not afforded by any other agent in nature. It is highly complex in its organization, having a high atomic constitution, and yet it is the simplest of all compounds when considered in regard to the nature of the elements of which it is composed.

In studying the sweet principle of plants, we soon discover that they possess the capability of elaborating more than one variety of sugar in their structures, and that there is a curious blending of several forms in the ripened fruits which come upon our tables. We discover, also, that each plant has the power of manufacturing a special variety, or a combination of varieties, and that this law of their constitution cannot be changed by man.

In beet roots, in the stems and trunks of the sugar maple tree, the sycamore, the palm, in sugar canes, in the sorghum plant, in

the stalks of maize, in grasses, we have one kind of sugar, called *sucrose*, which is the sweetest variety; in grapes we have another distinct variety, called *dextrose* or *glucose*; in apples and other fruits we have still another, called *fructose* or *levulose*. In melons we have a sweet which is nearly pure sucrose, or cane sugar. We learn from this examination not only that sugars differ widely, but that, for wise and doubtless beneficent reasons, the Supreme Intelligence has not permitted all fruits and plants to be sweetened alike. In that vegetable monstrosity called a beet, which is hidden from the clear sunlight and the air during the whole period of its growth, there are found juices which hold the most noble and valuable form of sugar known to man. The crimson tissues of this root contain the snow-white sugar which graces the tea tables of the kings and princes of continental Europe; and millions of pounds find their way into commerce, always commanding the highest prices. The humble, earthy beet, can hold up its head in pride, when its sweetness is contrasted with that of the petted grape, which occupies the foremost place among our delicious fruits. The grape is sweetened with glucose, an ignoble form of sugar which the chemist can make in the laboratory, and its production does not require the employment of costly or rare materials. Even if it lessens our respect for the tempting fruit of the vine, the truth must be told. The chemist can make the sweet juices of the grape from old cotton rags and old newspapers; and if this statement does not indicate a sufficiently low origin, I have only to remark that it can be made from common sawdust as well. Human art has not yet been able to number among its triumphs the production of the sugar of the beet, the maple, or the cane.

The sweet principle of fruits, other than the grape, cannot be imitated in the laboratory. It is a mixture of at least two forms of sugar, — sucrose and dextrose, — in varying proportions, as is shown in the tables on page 51.

How curious and mysterious is this plan in nature, of delicately adjusting the taste of our noble fruits, so as to produce a sense of the highest enjoyment in their use. In some fruits we find the sweet to exist in its lowest modified form; but this is not due to a lessening of the amount of the sweetest sugar, but to the presence of an entirely different kind. It is probable that the peculiar delicate flavor and taste of the grape could not be secured by any adjustment of quantity of sucrose or cane sugar, or by any mix-

tures. It requires glucose, pure and simple, to act in conjunction with the delicate acids, in order that we may have this fruit in its highest perfection. The watermelon would not be the fruit it is if it had not the capability of manufacturing cane sugar in large quantities; neither would the apple, the peach, the cherry, the strawberry, or the pear be what they are, if the plants and trees upon which they grow had not the power of bringing into play a subtle chemistry, by which is produced a mixture of distinct forms of sweets which no art of man can imitate. If there was in nature but one kind of sugar, the number of choice delicacies in our gardens and fruit orchards would be lamentably small.

But nature does not, in the bestowal of her fruits, spontaneously, or of her own free will, sweeten them for us so acceptably. What are designed to be luxuries and the most highly prized forms of food, she ordains shall be bestowed only through the exercise of labor, care, and skill, on the part of man. No one of the fruits in its wild or native state holds any considerable quantity of sugar of any kind, — not enough to make it acceptable to the taste, or fit it to serve as food. It is only by skilful cultivation, by hybridizing, by budding and grafting, that we have secured the sweet principle in fruits. We have, as it were, educated the dumb chemists in the vegetable cell, and fitted them for the work which nature made them competent to perform under man's guidance.

It is indeed wonderful that we can increase or diminish the amount of sugar in any kind of fruit or plant by cultivation. The beet, for example, under ordinary care, will afford from four to six per cent of sugar; but, by scientific and generous culture, the percentage can be nearly or quite doubled. I have succeeded in increasing the sweet principle in apples, grapes, and peaches, by cultivation and proper fertilization, and this, when the principle was originally present in normal quantity. In increasing the sugar, we also increase every other desirable quality in the fruit; for one principle cannot be forced into prominence without being accompanied by all the others.

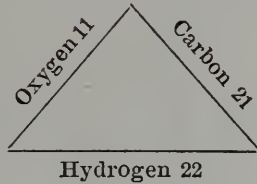
I will now endeavor to explain by the aid of chemical symbols the nature of the different sugars, and also show the nature of the sweet principle of some fruits. In the arrangement of symbols, table No. 1, I bring to view the atomic constitution of a molecule of sucrose or cane sugar; also that of starch, and the necessary changes to convert starch into sugar.

Table No. 1.

| | | | |
|-----------------------|-----------------|-----------------|-----------------|
| Sucrose | C ₁₂ | H ₂₂ | O ₁₁ |
| Aqua | H ₂ | O | |
| Starch | C ₆ | H ₁₀ | O ₅ |
| Multiply by | | | 2 |
| | <hr/> | | |
| | C ₁₂ | H ₂₀ | O ₁₀ |
| Add | | H ₂ | O |
| | <hr/> | | |
| Sucrose | C ₁₂ | H ₂₂ | O ₁₁ |

Table No. 2.

| | | | |
|-----------------------|-----------------|-----------------|-----------------|
| Glucose | C ₆ | H ₁₂ | O ₆ |
| Multiply by | | | 2 |
| | <hr/> | | |
| | C ₁₂ | H ₂₄ | O ₁₂ |
| Subtract | | H ₂ | O |
| | <hr/> | | |
| Sugar | C ₁₂ | H ₂₂ | O ₁₁ |



| | | | |
|-------------------|----------------|----------------|---|
| Alcohol | C ₂ | H ₆ | O |
|-------------------|----------------|----------------|---|

Table No. 3.

HOW FRUITS ARE SWEETENED.

| | Cane Sugar. | Grape Sugar. |
|----------------------------------|-------------|--------------|
| Strawberries | 6.37 | 4.98 |
| Peaches | 2.10 | 3.17 |
| Pears | 62 | 8.42 |
| Oranges | 4.22 | 4.36 |
| Grapes (Black Hamburg) | 00 | 17.26 |
| do. (Concord) | 00 | 14.08 |
| do. (Green) | 00 | 1.60 |
| Melons (Water) | 8.17 | 00 |
| do. (Musk) | 9.02 | 00 |

| | | | |
|-----------------------|----------------|-----------------|----------------|
| Dextrose | C ₆ | H ₁₂ | O ₆ |
| Levulose | C ₆ | H ₁₂ | O ₆ |
| Fruit Sugar | C ₆ | H ₁₂ | O ₆ |

A molecule of common water is represented thus, $H_2 O$, which means that it is composed of two atoms of hydrogen and one of oxygen. Now to form sugar out of starch we must double the molecule, and this we do by multiplying the starch molecule by two, but this does not give us sugar; it is necessary to add a molecule of water, which gives us in the diagram, sugar, as shown by comparing the resultant line of notation with the upper.

In table No. 2 is shown the composition of grape sugar or glucose, and also how it must be modified so as to change it into cane sugar. We must first double the molecule as is shown, and then *subtract* one molecule of water, and this gives us cane sugar, $C_{12} H_{22} O_{11}$. In the triangle is presented a hypothetical molecule of cane sugar, composed of its constituent atoms, Oxygen, Hydrogen, and Carbon. It is apparent that a substance so constituted must be in a condition of unstable equilibrium, for there is constant tendency to change and form new compounds. Sugar is a substance very easily decomposed, and by the application of heat, a large number of new compounds result. One of these new bodies is alcohol, which is represented by the formula



An examination of the diagrams will show you how starch is converted into glucose. Starch has the formula as shown,



Now if we add to a molecule one molecule of water $H_2 O$, we have glucose,



and this is all that is necessary to convert the starch of corn or potatoes into the sweet principle of grapes.

We cannot convert starch into cane sugar, because we cannot double the size of the molecule and force into combination one more molecule of water. If we could accomplish this result, all our crystallizable cane sugar would be made in the laboratory, and the growth of sugar cane, beets, etc., would cease, as the artificial process would supply sugar at cheaper rates.

We can make grape sugar out of starch, because we have discovered a method of forcing one more molecule of water into combination with it, and this gives us glucose.

Table No. 3 explains how several kinds of fruits are sweetened. The percentage of cane sugar and fruit sugars which enters

into strawberries, peaches, pears, etc., is shown. It will be noticed that in grapes no cane sugar is presented; the sweet principle is entirely glucose. Of course fruits vary greatly in the amount of sugar they contain. These examples are presented as the results of analysis made with the view of obtaining general or approximative results. Whilst it is possible to increase the saccharine principle, and also to modify the hydrated malic acid constituent in fruits, it is entirely beyond our power to change the fixed nature of vines, shrubs, and trees by any methods of cultivation or fertilization yet discovered. I know of nothing more wonderful in nature than the persistency with which vegetable structures adhere to their original bent or design. Trees producing sour apples, pears, peaches, or vines producing astringent grapes, cannot be turned aside from their laboratory work, unless by the introduction of scions, or the employment of the knife in other ways.

We all know that two trees growing side by side, from the same soil, breathing the same air, and precisely alike in external and internal structure, will grow fruit totally dissimilar in chemical constituents and physical appearance. If a young sour apple tree is cut off low in its trunk, and scions of another kind inserted, it is changed only above the point where they are placed. The chemical reactions below continue true to their original instinct, and if fruit comes from a sprout it is charged with the acid juices of the parent tree.

We thus have the bewildering fact brought before us that sap circulating through one portion of a tree culminates in the production of excess of acid in the fruit; while in another there is found an excess of sugar. It is not unusual to observe a newly set scion bud, blossom, and bear fruit the first year. The apple may weigh ten times as much as the frail scion which held it up, and supplied the nutriment necessary for its growth, but the little twig transplanted to an alien limb, will set up a laboratory of its own, and from the strange juices brought to it, will manufacture fruit entirely dissimilar to its companion fruits growing in close proximity. An example of this nature was afforded in my orchard, when from a scion having a surface for cell action of only nine square inches, a sweet apple was grown weighing seven ounces, and affording from its juices ninety-three grains of fruit sugar.

We have, however, still more wonderful examples of fruit chemistry in apples which in their own structure exhibit sectional differences of composition, one-half or one-quarter being saccharine, the other portions being extremely acid, and having the sectional lines distinctly drawn. I have seen a basket of this remarkable fruit in which the divisions were in all proportions, but each one unmistakably marked.

I have brought to view these interesting examples of plant chemistry, not with the supposition that they are new to you, but simply to awaken inquiry and stimulate research, that we may, if possible, obtain new light upon some most perplexing problems.

The sap of plants, which is largely water, may have but little agency in influencing those changes which result in the production of the sweet principle in fruits. Cell action, controlled by the actinic solar ray, is unquestionably the source or active agent in the chemical changes which accompany vegetable life. The vast volume of water, which in the form of sap courses through our fruit trees, cannot, however, be lightly regarded. It brings to the cells the elements and molecules of inorganic material, which enter into the reactions involved in plant chemistry; and, it is only through the sap that we can beneficially influence the products of our orchards and vineyards. It is probable that we do not often stop to consider the immense preponderance of water in our fruits, which is shown by analysis.

Several years ago, I made analysis of several varieties of apples, with the view of determining their exact food value. Among them were the Tolman's Sweet, Hubbardston, and Baldwin.

The apples selected were in different stages of ripeness, the Hubbardston being more advanced than the others. Very important modifications are produced by the chemical changes in apples as they approach the stage of maturity, or the period when they become mellow and ready for the table. The amount of sugar increases, and the hydrated malic acid decreases, or disappears altogether in some fruits. The cell walls of the structure become softened, and readily break down; oxidation begins at any point where imperfection or abrasions in the skin occur. The amount of nutritive material is to some extent increased in ripe apples, and they are much more easily digested and assimilated by men and animals.

The results of the analysis, were as follows :

| HUBBARDSTONS. | |
|--|--------|
| Water, | 88.57 |
| Albuminoids, pectose gum, and sugar, | 11.27 |
| Ash, | 0.16 |
| | 100.00 |
| TOLMAN'S SWEETS. | |
| Water, | 83.29 |
| Albuminoids, sugar, pectose gum, etc., | 16.54 |
| Ash, | 0.17 |
| | 100.00 |

The unripe Baldwins gave 87 per cent water, with a less amount of albuminoids and sugar than the others, and considerable free hydrated malic acid. The sugar varied from about 5 per cent. in the Baldwins to 9 per cent. in the Sweets. The total insoluble matters, including skin, seeds, pectine, ash, etc., averaged about 3.25 per cent.

These results show how largely preponderating in apples is the water, which in amount is about 85 per cent. of their weight. Therefore, a tree bearing 30 bushels (46 pounds to the bushel), holds up in the fruit about *half a ton* of water. The nutritive value of apples, is, of course, not in the water, but in the solids,—albuminoids, sugar, and gum. In a bushel of Hubbardstons, there is about six pounds of soluble nutritive material at the period of ripening; in Tolman's Sweets, about seven pounds; in Baldwins, five pounds; and this material will vary to a considerable extent in value. Sugar is a carbonaceous substance, and nutritive in a certain direction. It is mainly useful as fuel, and by oxidation serves to maintain animal warmth. The albuminoids are nitrogenous and therefore are foods proper; the gum is also a food.

The albuminoids are seldom found above half of one per cent. in any varieties, and this would give us less than four ounces in the bushel; of sugar, we find in a bushel about two and a half pounds in acid fruits, and considerably more in sweet.

The analysis of apples as presented, shows that the amount of nutriment, or absolute food they contain, in proportion to bulk, is small. This research extended over considerable ground, much of which is not pertinent to this discussion. I will simply say that, as regards apples as food for animals, my practical experience in

feeding them confirms the results of analysis. They are of *some* value, and when fed in connection with meal, serve to give zest to the appetite and keep animals in health. The riper the apples the better the results, and they should not be fed in a half-frozen state to milch cows, as this course will invariably cut short the milk supply. If they are cooked by boiling, their value is much enhanced, as more perfect digestion results.

In the cultivation of fruits, we should not be misled by the fact that they do not, in themselves, exhaust soils, except in a slight degree. The constituent principles of fruits are, to a large extent, organic, and, therefore, derivable from water and the atmosphere. Sugar, the important principle of all fruits, takes nothing from the soil which has money value. The albuminoids, as has been shown, are very sparsely distributed through most of our fruits, and as they hold the nitrogenous element, it is seen that nitrogenous manures are not needed in large quantities in orchards or fruit gardens. Analysis of the grape shows that in most varieties nitrogen, as supplied in manures, is not necessary. The results of analysis in the case of all fruits, have been satisfactorily confirmed in my practical experience.

I have never found nitrogenous manures to exert marked specific influence upon any of my fruit crops, and years ago I discontinued their use. Fruit trees, shrubs, and vines need nitrogen, but the spontaneous supply in soils is fully equal to the comparatively small amounts required. There is one mineral element which may be said to be the *pabulum par excellence* of growing fruits, and that is potash. It is certainly true that we cannot raise perfect and desirable fruits if we withhold this element from the soils of our orchards. When it is considered that we influence growing fruits only through the act of rendering the tree or vine vigorous and healthy, and when we further consider how much potash is required to maintain a normal condition in large fruit trees, which are constantly under the pruning saw and knife, we obtain some correct views of the importance of this agent in soils. Both the fruit of the vine, and the vine itself, are great consumers of potash. The same may be said of most of our small or soft fruits.

It is not usually advisable to attempt to reclaim and render productive a worn out grape border, but if any satisfactory success is attainable, it is only through a plentiful supply of good wood ashes and bone meal.

Twenty years ago, I discovered that it was best, in preparing borders for cold grape houses, to use plenty of wood ashes, and to place the fertilizing materials in successive thin layers, rather than in the usual form of a mixed heap. I have one border prepared in this way which is made up of sixty alternating strata of different fertilizing substances, and they have remained undisturbed for twenty years. The fruit product from this border has been uniformly excellent in quantity and quality, from year to year, and renewal has not been necessary.

My view is, that the subterranean feeders of the vine will follow what may be designated as vegetable instinct in procuring food, going no further for it than is necessary. If we place phosphoric acid, lime, potash, and nitrogenous salts in distinct layers, each resting upon one of good soil, we place our vine roots, as it were, at a table spread with many dishes, and unerring instinct will guide in selecting what is needed to keep the vine and fruit in the best possible condition.

The saccharine qualities of the Black Hamburg and Frontignan varieties, are greatly improved by having at hand plentiful supplies of potash; and wood ashes is the best possible source for this alkali. The German chlorides are next to be preferred, but they do not, in vineyards, meet the desirable results supplied by ashes.

The ordinary German Kainit, as found in commerce, I class among the poisons in the list of assumed vegetable foods. I have never failed to observe injurious results in the use of these salts on my farm. Common salt is not a manure, and we may as well so decide once for all.

After an experience of nearly a quarter of a century in conducting an experimental farm, I have reached the conclusion that the growth of our fruits, and most of our cereal crops, is best promoted by the use of a fertilizing mixture, made up of finely ground fresh bones and good wood ashes. This mixture I arranged and recommended twenty years ago, and I find after persistent soil experiments, extending over many years, that I am using it more freely than ever.

My method of preparing it is, to take six barrels of pure raw bone flour, and twelve of good wood ashes, and mix them well together upon a shed floor, adding, during the mixing, twenty buckets of water and one barrel of gypsum or plaster. This mixture may be allowed to stand a few weeks, or it may be used at

once if needed. If permitted to stand long, it heats from chemical action, and the freed ammonia is in part fixed as a sulphate by the plaster, but not all of it.

For fruits of every kind I know of no better fertilizing material, and as it supplies every needed element of nutrition, its effects are remarkably persistent and immediate.

But, gentlemen, I must detain you no longer. I cannot think that I have presented anything new, or of special value to a company so intelligent and experienced as this. There are old facts, and forms of knowledge which it is well to call up for consideration occasionally, as we often find that the good and excellent have been neglected because they are old.

Dr. Nichols added, in further explanation of the chemical composition of sugar, that it is a compound of pure water with carbon—absolutely pure water with the elements of a diamond. It is a very unstable compound; when placed over the flame of a lamp the water escapes, and the carbon is brought to view. A molecule of sugar is like a watch spring wound up; the struggle between the chemical forces is towards change into lower combinations. A potato is but a mass of starch, and can be changed almost entirely into sugar. The change of starch into sugar requires the presence of diastase, which is a starch solvent apparently provided for a specific purpose. Sugar cane, a few weeks before it is ripe, has no sugar; after it is mature it has no starch, and the case is the same with most fruits. The production of sugar is not exhaustive to the soil; the refuse from the manufacture of beet sugar returns to the soil all inorganic substances taken from it. In strawberries there are three kinds of sugar, two of which are uncrystallizable and one crystallizable. Most pears contain uncrystallizable sugar. The orange will grow in sand with the addition of potash and lime. The Black Hamburg grape, when ripe, has about seventeen per cent of glucose, and its juices are most agreeable though we cannot tell precisely why. Changes in fruits go on with great rapidity at the time of ripening. Beet sugar is as sweet as cane sugar. The chemical composition of milk sugar is the same as that of cane sugar, but it has only one-third of its sweetening power. We have in the sugars interesting examples of isomerism; bodies, so far as we can distinguish, constituted alike chemically, but having very unlike physical properties.

Dr. Nichols also stated that wood ashes are often adulterated; he bought one lot from Canada which contained by analysis nine per cent of potash, but the next lot had less than four per cent. He regarded the discovery of the Stassfurth potash salts as providential; the supply is enormous, millions of pounds being produced each year. In kainit there is so large a proportion of common salt that it is apt to kill grass. The chlorides of potash may be mixed with phosphates and nitrate of soda and extended with humus, so as to form composts closely resembling stable manure, in concentrated form. The Stassfurth salts are now brought to this country and used by official analysis made at the salt mines, and these determinations are usually safe and reliable.

DISCUSSION.

Leander Wetherell said that the lecturer had stated that salt is in no sense a manure. This the speaker doubted, but while he did not deny it he stated his observation as follows: A farmer in Ware, whose farm is contiguous to the right bank of Ware river, has raised winter rye on a piece of light soil for ten years, more or less, using no stable manure, but has applied annually a top-dressing of common salt of an inferior grade, called "refuse salt," purchased in Boston for that special purpose. He sowed it on, mixed with a little plaster, broadcast at the rate of three bushels per acre. Visiting this farmer annually the opportunity for careful observation for years was enjoyed. The crop of rye was heavy and the straw was clean and white when the crop had ripened; the grain was of superior quality and the annual yield was good. The lecturer was asked by Mr. Wetherell to explain this phenomenal observation in growing winter rye upon thin soil, very poor in humus. Similar experiments were made by a farmer in Hardwick on a farm also contiguous to the right bank of Ware river, not only with winter rye but other farm crops, where salt produced marked effects as a "fertilizer," as he called it.

Dr. Nichols said that we cannot obtain uniform results on all soils. The Ware farmer obtained his crops independently of the action of the salt. There are many farmers in Massachusetts who raise good rye crops on light silicious soils for many consecutive years, without the use of a spoonful of salt or any fertilizer. Too much attention is given to apparent variations in known or fixed

principles. Too much time is taken up in farmers' meetings in discussing trivial and imperfectly conducted crop experiments. The principles of agriculture should be studied.

George F. H. Markoe said that he had seen raisins containing crystallized glucose, and specimens of beautifully crystallized anhydrous glucose which were manufactured in this country, and which is now being produced in a large way under a patented process. The glucose of the market is generally impure, but any pure glucose can be crystallized from its alcoholic solution.

Dr. Nichols said that the glucose of dried raisins is never crystalline, but by evaporation of water amorphous lumps are formed which the gentleman had mistaken for crystalline bodies. He had seen the most recent imported specimens of glucose, but none of them were crystalline. No one has yet succeeded in crystallizing glucose in a practical way.

Hon. Marshall P. Wilder said that he was delighted with Dr. Nichols's lecture; he spoke of what he knew, and there is no man better capable of instructing us. The facts given by him in regard to the use of ashes and bone dust are extremely valuable, and he advised all the cultivators present to get all they can. Sugar of different kinds is one of the most healthy substances. It is possible to produce sugar on our own soil. It has been stated that sorghum sugar cannot be crystallized, but it is now a settled fact that it can be, and wherever sorghum will ripen its seed, sugar can be made. The seed is worth nearly as much as corn, and the refuse of the stalks is valuable for the food of animals and the manufacture of paper.

Professor Markoe said that all chemical action is a series of substitutions, in which might makes right, or the stronger agent replaces the weaker one. The action of caustic lime liberates ammonia gas from ammoniacal salts. If sulphate of ammonia is mixed with caustic lime, the ammonia is liberated, and sulphate of lime is formed. Sulphuric acid added to fertilizers will fix the ammonia. The so-called rectified guano contains sulphuric acid, which has been added in quantity sufficient to transform most of the ammonia into sulphate of ammonia.

Dr. Nichols said that not until lately had he been able to purchase the Charleston phosphate nodules ground fine enough for making fertilizers, but now an impalpable powder can be obtained, and he had used it with considerable success. It makes a low-

priced, good fertilizer. The value of nitrogenous manures is unsettled, and he thought we had considerable to unlearn, especially in regard to animal substances holding potential nitrogen. He thought dried blood and animal tissues of uncertain value, and that further study and long-continued soil experiments are needed to settle their value on a reliable basis.

President Hayes spoke of Dr. Nichols's paper as most interesting, especially his description of the little graft as a factory working out the processes of nature. The lecture was as eloquent and powerful as any sermon, and he wished thousands could have heard it. He was also glad to hear from Professor Markoe, and to have these two chemists bring the latest results of their science before the Society, and it was pleasing to see the kindness between them, as evinced by the reception accorded by each to the different views of the other. In behalf of the Society, the President returned grateful thanks to Dr. Nichols for his interesting, eloquent, and instructive address.

BUSINESS MEETING.

SATURDAY, February 10, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The President read an invitation from the Imperial Russian Horticultural Society, to attend and contribute to the International Exposition of Horticulture and Congress of Botanists and Horticulturists, to be holden at St. Petersburg, May 17-28, 1884, in celebration of the twenty-fifth anniversary of that Society.

Hon. Marshall P. Wilder moved that a delegation be appointed by the Chair to attend the Exposition and Congress, with power to appoint substitutes. The motion was carried, and the Chair appointed Mr. Wilder, E. W. Wood, and William H. Spooner delegates.

The Secretary read a letter from Francis Darwin, Cambridge, England, expressing thanks, in behalf of the family, for the testi-

monial to the memory of his father, Charles Darwin, adopted by the Society at the meeting on the 30th of December, 1882.

Adjourned to Saturday, February 17.

MEETING FOR DISCUSSION.

THE BEST LIST OF OLD AND NEW HERBACEOUS PERENNIALS FOR GENERAL CULTIVATION; ALSO, NOTES ON RARE HERBACEOUS PLANTS DIFFICULT TO CULTIVATE, AND ON IMPROVEMENT IN OUR NATIVE HERBACEOUS PERENNIALS.

By WARREN H. MANNING, Reading.

In presenting this subject for discussion, I will reserve the List of Plants for the close; and, in opening, will make some mention of the Cultivation of New and Rare Plants.

It is always safe to follow, as nearly as possible, the conditions in which a plant flourishes naturally, unless a better method of cultivation is known. In case neither is known, one may be guided to a great extent by the appearance of the plant, which is very often an indication of the soil it grew in, and may give it the treatment that has been given successfully to similar plants. An aquatic or bog plant can usually be distinguished by its large cells and soft, fleshy stems and leaves; a plant growing on dry, sandy or gravelly soil by the dry, harsh feeling of the stems and leaves, or the large, deep growing tap root. Alpines and rock plants are generally small and dwarfed, and often fleshy, with long and fine hair-like roots; frequently from a short rootstalk or tap-root.

There are, of course, many exceptions to these observations, but any cultivator of herbaceous plants, or observer of plants in their native homes, well knows that alpine plants are quite different in appearance, as a class, from bog plants, and bog plants from those growing in sand or gravel. The lines are very often quite clearly marked between whole families of plants, and it is often a good way of determining the habit of a plant to find in what family it belongs. For example, the hardy North American representatives of the Orchid family nearly all grow in moist, shady situations in woods or meadows, in a peaty or leaf-mould soil; the Pink family

in dry, well drained, light soils ; the Composite, Mint, and Pea families, with few exceptions, in any good soil ; and the Iris family in wet, boggy situations.

Those plants that will adapt themselves to nearly all conditions are, of course, easy to cultivate ; it is those requiring special conditions for success that we shall have the trouble with, and the Alpine plants, as a class, contain the greater number of these ; but they are very beautiful, and well repay all trouble spent on them to secure success. This success must be gained by patience and perseverance under repeated failures.

In England, gardeners said that Alpine plants could not be grown in the open ground ; Mr. Robinson believed any of the hardy ones could be grown if proper methods were used, and he tried their cultivation. His book on "Alpine Flowers" will show his success.

But we must not try to grow the same or similar plants by his treatment, although we may get many useful hints from it, for our climate is quite different from that of England ; they do not have our scorching summer sun, nor do they have the frequent and sudden changes from the freezing temperature of night, to a hot, burning sun in the morning, without a veil of mist to modify its fierceness, which is so destructive to our herbaceous plants. We cannot depend on the rockery as they can. Mr. Falconer, of the Botanic Garden at Cambridge, who has had great experience with herbaceous plants, both in England and in this country, says that most Alpine plants that he has grown here do much better in the open border than in the rockery. They must not be in such a position as to allow the water to settle about them, and it is best to mulch them with stones to keep the soil about the roots moist and at an even temperature.

Neither can we depend on England or Europe for Alpine plants that will succeed under the conditions presented here. We have our own White, Alleghany, and Rocky Mountains to draw supplies from, and any traveller in these mountains will testify to the beauty of the Alpine flora. You will very likely say that these plants cannot be obtained ; but I have no doubt that those who have a large collection of herbaceous plants for sale, and who have correspondence with collectors in all parts of the country, will get them when there is a demand for them.

These difficult classes of plants must be taken in hand by some

amateur who has a sufficient love for the work, and sufficient interest in the results to be gained, to carry his experiments to a successful issue. Those in the nursery business, as a usual thing, can only grow such as sell readily at a profit.

The above remarks on the treatment of Alpines will also apply, so far as the water settling about the plants is concerned, to succulents, such as Sedums and Semipervivums, which are also Alpines, for if it does, it will rot the plant; but they will grow in very poor, dry soil, or on rocks in most barren and unpromising spots. In fact, these are some of the most available and successful plants for covering our rockeries.

Sand plants will, as a usual thing, do much better on their own soil than in a richer loam; for if the soil is rich, they are liable to make a strong growth of foliage at the expense of the flowers, and the plant is very likely to be killed by the first hard frost, while, if it were grown in a poor, sandy soil, it would blossom freely, ripen its growth early, and withstand frost.

If a plant is not successful in one spot, move it to another; it is surprising to see what a little difference in soil or position will do for a plant. Often a position where no perceptible difference from the former locality is to be seen will make all the difference between success and failure.

Most of our native plants are improved by removing them to cultivated ground, where they are protected from the inroads of stronger growing plants or weeds, that would kill them out under the same conditions of soil in a wild state. Take, for example, the Trilliums, which will make fine, large clumps in the garden, while in the native woods they are seldom found with more than a single bulb in a place. The Jack in the Pulpit is greatly improved in the size of the plant, leaf, and flower. *Aquilegia Canadensis*, or wild Columbine, cannot be excelled in habit of plant, and beauty and abundance of flowers by any other cultivated *Aquilegia*. *Lobelia cardinalis*, or Cardinal flower, flourishes finely in all good garden soils. The Wild Calla, Lizard's Tail, and many others, are greatly improved by being cultivated. When established in cultivation, these and others should be improved by the same arts of horticulture as have brought the beautiful Phloxes, Larkspurs, and Hollyhocks to their present perfection.

In making a list of the most desirable herbaceous perennials for general cultivation, we must see that there is a sufficient variety

in color and in the flowers at all seasons; also, we should choose plants of good habit of growth, and thoroughly tested. It would be impossible to give a list that would be best for all localities, but a list of such plants as are really desirable in the ordinary flower garden would be useful to those wishing to make a selection. Many of the plants named, such as Tulips, Phloxes, Pæonies and Hollyhocks, are worthy of exclusive attention, and it would be a source of much pleasure and instruction for any one to experiment with a certain flower, in connection with his general collection; to make it a specialty, and improve it and its varieties as much as possible by hybridizing, selecting improved seedlings, and propagating sports; but if one did not wish to do this, a few of the choicest and most select varieties should be chosen to represent it.

I hope the remarks and suggestions made in this paper, and also the list of plants, will be thoroughly discussed by those present. Fifty more equally desirable plants might be added to the list, but I will not run the risk of making it too long.

SPRING FLOWERING PLANTS.

| | |
|----------------------------------|------------------------------|
| Adonis vernalis, | Dodecatheon Meadia, |
| Allium Moly, | Erythronium Americanum, |
| Anemone Pulsatilla, | Iberis sempervirens, |
| Aquilegia Canadensis, | Mertensia Virginica, |
| Bulbocodium vernum, | Phlox reptans, |
| Convallaria majalis, | “ subulata, and varieties, |
| Crocuses in variety, | Polemonium reptans, |
| Dicentra eximia, | Scilla Sibirica, |
| Dicentra (Dielytra) spectabilis, | Tulips in variety, |
| | Viola pedata, and varieties. |

SUMMER FLOWERING PLANTS.

| | |
|----------------------------|--------------------------------|
| Achillea Ptarmica fl. pl., | Gypsophila paniculata, |
| Aquilegia cærulea, | Hemerocallis graminea, |
| “ chrysantha, | Iris Germanica, and varieties, |
| Asclepias tuberosa, | Platycodon grandiflorum, and |
| Campanula Carpatica, | varieties, |
| Centranthus ruber, and | Pyrethrum roseum, and va- |
| varieties. | ties, |
| Coreopsis lancolata, | Spiræa Filipendula, |
| Delphiniums in variety, | Iris Kæmpferi, and va- |

| | |
|---|---------------------------------|
| Lilium auratum, | Lychnis diurna fl. pl., |
| “ candidum, | Pæonies in variety, |
| “ elegans var. incom- parabile, | Papaver orientale, |
| “ superbum, | Phlox decussata, and varieties, |
| Lobelia cardinalis, | Spiræa lobata, |
| Lychnis chalcedonica, and varieties, | Ranunculus acris, fl. pl., |
| | Veronica amethystina. |

AUTUMN FLOWERING PLANTS.

| | |
|----------------------------|----------------------------------|
| Aconitum Japonicum, | Helianthus orgyalis. |
| Anemone Japonica, | “ decapetalus, |
| Cassia Marilandica, | Hibiscus flavescens, |
| Funkia Japonica variegata, | “ Moscheutos, |
| “ subcordata, | Lilium speciosum, and varieties, |
| Gentiana Andrewsii, | Rudbeckia nitida. |

DISCUSSION.

Dr. Henry P. Walcott was called on, and said that the only class of hardy herbaceous plants that he had cultivated were the native Orchids, with which he was quite successful in an artificial bog in a brick tank. The Oregon variety of *Calypso borealis* had flowered two years, growing in living sphagnum. *Habenaria ciliaris* also flourished. *Rhexia Virginica* grew so vigorously as to become a perfect weed, and had to be taken out, but it is so beautiful that he will prepare a separate bed for it.

Mr. Manning said that the hardy Orchids are very interesting, but not suited to general cultivation. In the Botanic Garden at Cambridge, the Cypripediums are successfully cultivated. *Liparis liliifolia* has improved under cultivation, having several more flower buds than when growing wild. A friend has a border of *Viola pedata* to his garden path, which blossoms twice a year.

Edward L. Beard said that the Narcissus is one of the most neglected plants. *Narcissus poeticus* is generally badly grown; it wants thorough care and cultivation, and will repay it. A friend of his had a large ravine running through his estate, with bare and unsightly sides, and Mr. Beard suggested to him that he should make pockets in the sides and fill with soil and plant narcissuses, and along the sides of the brook which ran through the ravine,

similar bulbs. He planted two thousand bulbs there, and was highly pleased with his success. The double *Narcissus poeticus* has a tendency to drop its buds; which is caused by leaving the plants, as is generally done, until the soil becomes exhausted. Constant feeding, and occasional shifting into new locations must be attended to. He had been very successful by giving fresh soil, and had produced astounding development. The long tubed species of *Narcissus bicolor*, of which the Emperor and Empress are two of the finest varieties, amply respond to any care given them. They are quite hardy; the speaker grows them on top of a clay bed. They do not seed, but increase from offsets. Some of the varieties will not grow here, but there is an ample list that will. The Lily of the Valley, also, is generally left to take care of itself, but if they are transplanted, and the soil is replenished, they will give astounding results. The same mistake is made with many herbaceous plants. The new Double Pyrethrums are most desirable; they require good culture and division of the roots. Some herbaceous plants will live along without much care, but the finer kinds require as much as a bed of roses. The general tendency is to neglect them. The speaker is very fond of Delphiniums. In England, the beautiful *Iris Kœmpferi* dies out, but it is constant here, particularly in damp localities. The *Anemone Japonica*, of which he prefers the white variety, may be placed in the foreground of useful plants.

Hon. Marshall P. Wilder spoke of the old hardy perennial double Candytuft as having been so neglected, that ten or fifteen years ago it was introduced as new, and sold for a dollar a plant. It is very desirable.

Mrs. H. L. T. Wolcott said that she lost all her narcissus buds for several years, and in despair she took them up and reset them, and last year every bud gave a flower. The idea that herbaceous plants can be neglected is incorrect. Eternal vigilance is the price of a garden as well as of liberty, to which, in the case of the garden, must be added fertilizers.

Dr. Walcott said there is one plant, the Fraxinella, which will flourish, year after year, without removal. He has them fifteen or sixteen years old, and he knows a plant seventy-five years old which flourishes as well as ever. It is the typical hardy perennial.

Mr. Wilder spoke of the *Spiræa Sinensis* (known, also, as *Spiræa*, *Astilbe*, or *Hoteia Japonica*,) as one of the most beautiful

herbaceous plants. It forces admirably. The Tree Pæonies are superb; Elizabetha, which he introduced twenty-three years ago, at a cost of three hundred francs for the first plant, and which is still rare, is one of the finest varieties. The tree pæony is slow of propagation, and, therefore, the new kinds are very dear. Nothing is more gorgeous than pæonies, either tree or herbaceous, but lately they have been much neglected. If the old dark crimson variety were now introduced as new, nothing would be thought to surpass it. The speaker believed it would be well for the Society to offer premiums for hunting up the good old things that have been passed by.

Mrs. Wolcott thought that if it is the intent of the Society to promote horticulture among the masses, it should encourage the cultivation of easily grown and cheap things, like the fraxinella, which, however, she had tried over and over again without success. She asked this in behalf of the community generally. She was led to speak of this point by the interest she felt in window gardening, and by her knowledge of the inability of many, who would like to cultivate flowers, to pay more than a very small sum for plants. Plants to be freely cultivated, must be sold at prices within the reach of the people. The tree pæony is, virtually, out of the reach of people generally.

Mr. Beard thought Mrs. Wolcott had not given her fraxinella a suitable soil, and advised her to try another.

Mrs. Wolcott replied that she had tried every soil.

Mr. Beard thought that it likes a clay soil. He planted it in such soil five years ago, and it has thriven. He acknowledged that he had not lived up to his own theory of good cultivation, in connection with this plant, which had been left to take care of itself with good results.

Mrs. Wolcott thought that knowledge must be added to eternal vigilance and fertilizers, for success in gardening. She dug up a large clump of fraxinella with a pick-axe and transplanted it, hoping from its age and size to secure a plant, but was unsuccessful.

C. M. Hovey said that the fraxinella is somewhat difficult to increase. It has very strong, woody roots, with few fibres, and it takes some time to get established. It is very beautiful but cannot become common. The *Asclepias tuberosa*, or Butterfly Weed, he had known since he was a boy, and he esteemed it the most beauti-

ful of all our native perennial plants. It resembles the fraxinella in the character of the roots and the difficulty of transplanting. At the South Shore he saw clumps as large as a bushel basket along the sides of the roads, and some varieties darker than usual. He tried to dig up some roots with a trowel, but found it impossible. He finally succeeded in digging up a few roots, which were like parsnips, but nearly all grew. It makes no offsets, and the best way to propagate it is to sow the seed where the plant is to stand. It has been cultivated by only two or three individuals.

The herbaceous pæony is everybody's flower. It has been improved by English, French, and American cultivators; it is easily grown, not difficult to increase, and forms a show not surpassed in the flower garden. Many of the varieties are quite fragrant, and some are desirable for that quality. Tree pæonies are now comparatively cheap; plants which would formerly have cost from five to ten dollars, can now be bought for from a dollar to a dollar and a half. Only a few new species of herbaceous plants have been introduced in the last forty or fifty years. The *Delphinium* has been much improved; some of the new kinds are apt to die off, but such is not the case with some of the old ones like *Delphinium formosum* and the Bee Larkspurs; you can hardly kill them. Some of the old kinds are very stately in growth. We are going back to the cultivation of the dahlia, which went out of fashion some years ago; it is now coming up in the single form. We have been surfeited with double flowers; single tulips are much more admired than double, but double stocks are better than single.

Mr. Wilder agreed with Mr. Hovey as to the importance of restoring the cultivation of the pæony. It seeds freely and is easily cross-fertilized, and everybody can have them. Some of John Richardson's seedlings are equal to any that have been raised.

Mr. Beard spoke of the Everlasting Pea as one of the most beautiful and useful plants in the flower garden. It will scramble over anything, but rocks or a low trellis are best. If the seed pods are removed it will bloom continuously. There are three varieties, the rose colored, pure white, and striped. Like the fraxinella it forms immense underground roots, and wants to be put where it can be undisturbed. It is very useful for cutting. The Gloxinia is not a hardy plant, but he was induced to speak of

it because he saw it grown out doors last summer in a cold frame, and forming a most beautiful sight. The tubers were planted in the spring and the glass was shaded. The flowers come on stout stalks, and are most useful for cutting. The bulbs are easily wintered by storing them in sand, in a temperature of from fifty to fifty-five degrees. In the spring they must be started in the house and afterwards planted in the frame. The plan has been tried in England, but there they are generally coddled till the rust to which they are subject gets on them. The frame which he saw full of these gloxinias was fifty feet long, and was a sight to behold. The sashes were slightly tilted up, and the glass was whitewashed. The bulbs were planted in the ground.

President Hayes said that nothing could be more beautiful than the gloxinia. He had imported bulbs from England, and would try the method of cultivating in frames recommended by Mr. Beard.

Mr. Wilder said that a new class had been introduced called *crassifolia*; it is more robust and has larger flowers. There is no end to the number of varieties that can be raised of the gloxinia tribe.

Mr. Hovey advised the trial of Achimenes and Tuberous Rooted Begonias in frames, like the gloxinias, which Mr. Beard had spoken of. Some of the tuberous rooted begonias do well in the open air, but the flowers of the choicer varieties are so delicate that they do better in frames. The hardier varieties are very desirable and beautiful if treated like the gladiolus; they grow freely and bloom up to frost.

Mr. Wilder said he had seeds of tuberous rooted begonias then coming up. In England, Mr. Laing has 150,000 seedlings. There they surpass the scarlet geraniums for bedding.

Mr. Beard said that tuberous rooted begonia seed is very deceptive; like primula seed, four-fifths of it is apt to be chaff. He paid half a guinea for twelve primula seeds, and got one good seed out of the twelve. The inside of the pod of the begonia breaks up into chaff. Except in extraordinarily hot summers, the tuberous rooted begonia is one of the best bedding plants. He has five hundred seedlings stored away. The light colored varieties stand the sun better than the dark. They do better in partial shade out-doors than under glass. He stuck down branches in the beds to shade the plants. The double ones, with a little care, will

stand the sun, and are not so apt to drop their flowers as the single. They are very deceptive when raised from cuttings; they will go along through the summer, and in autumn no bulb is to be found; only a few roots have been sent out. A shoot which has a growing eye should be used for a cutting; it will not succeed with only a flower bud. He does not shorten the leaf when he plants the cutting.

President Hayes spoke of the difficulty of procuring good seed of improved varieties of flowers. He had seed of *Humea elegans* from which he got not a single plant. He had found seed from Dippe Brothers, of Quedlinburg, Prussia, very satisfactory.

J. W. Manning said that there is much unexplored territory where new species may yet be collected. He never saw such *Aquilegias* as in the Rocky Mountains, at an altitude of twelve thousand feet. There were other flowers entirely new to him, that were as showy as gloxinias. The atmosphere was so rare that walking was very exhausting there.

E. H. Hitchings spoke of a plant of *Lilium Canadensis*, with fifty-seven flowers, found in Lynn, by a friend. He recommended the cultivation of the native climbing plants, such as *Clematis Virginiana*, *Mikania scandens*, and *Apios tuberosa*.

Warren H. Manning said that the *Apios tuberosa* must be grown in moist soil, as the tubers frequently decay in dry soil. When it thrives, it is apt to become a weed. The *Iris Kæmpferi* is grown by the Chinese in ground flooded once a year. It wants care, and blooms better after dividing.

The subject for the next Saturday was announced as "New and Useful Shrubs, and the Best Method of Propagating," to be opened by William C. Strong.

BUSINESS MEETING.

SATURDAY, February 17, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

Benjamin G. Smith, Chairman of the Committee on Publication and Discussion, stated that a desire had been expressed by persons

residing too far away to avail themselves of the other advantages of this Society, to purchase its publications, and moved that the subject be referred to the Executive Committee. The motion was carried.

Adjourned to Saturday, February 24.

MEETING FOR DISCUSSION.

NEW AND USEFUL SHRUBS AND THE BEST METHOD OF PROPAGATING.

By WILLIAM C. STRONG, Newton Highlands.

In accepting the invitation of your Committee to open this subject of "New Shrubs and How to Propagate Them," I had no idea of the dilemma into which I was led, upon neither of whose projecting horns do I wish to impale myself. In the first place I have no disposition to cry up a list of novelties after the fashion of venders of new strawberries, new roses, new grapes and what not, which are being let out with a bang so loud that, in the recoil, the innocent public finds relief in the fact that nothing but smoke is left behind. I am not to be caught naming this and that new and marvellous shrub which, beyond question, is destined to do much towards transforming our gardens into a paradise, while at the moment I utter this prophecy I can notice the sly insinuation going round the room that "probably he has a large stock of that particular variety, all ready to place upon the market." Not into that trap do I put my foot.

Withdrawing from this horn with some little complacency, I turn to mention some kinds which I cannot possibly be able to offer for sale for at least a few months, and consequently concerning which I have no selfish and prejudiced motive, and, proceeding to dilate upon their extraordinary merits, I am about to make use of a great number of superlative terms, when I notice a queer kind of smile playing upon the countenances of some of our enterprising cultivators, and an occasional wink shooting across the room, and, if my ears did not greatly deceive me I caught a nurseryman's whisper that he catalogued that identical variety more than six months ago. Dropping this kind as speedily as I may, without too great betrayal of embarrassment, I turn to name, with

some confidence, another kind which has given me particular pleasure, enhanced, no doubt, by the thought that no one in this country, except myself, has ever beheld its marvellous beauty, when the first mention of its name is met with a loud guffaw, and the quick remark that that variety was discovered a score of years ago, and was even mentioned by Loudon, though subsequently it was lost. Mr. President, there are no new shrubs, they have all been let out; you have them; our ex-presidents of course have them; the ladies and gentlemen have all got them; we are even on this score and there will be no occasion to raise a laugh at our mutual expense.

Having thus effectually opened the subject, as requested, showing that, with the exception of artificial hybrids in the hands of the originator, there are no new shrubs, it will of course be pertinent to conclude with a few wise directions how to propagate them. First, *get* them, is a rule that will occur to the feeblest understanding. But before entering further upon this part of the subject I will name some shrubs which are not new, but which have merits that entitle them to be more generally cultivated than they now are. It will also be proper to mention the defects of some kinds, which are likely to limit their culture.

The Japan Maples of the *polymorphum* type, may be properly classed as shrubs—at least, in this country, it does not seem probable that they will exceed the usual limit of size of shrubs. There can be but one opinion as to the exceeding beauty of many of these forms. The variety known as *atro-sanguineum*, to which is added *purpureum* (as if the little plant were not already crushed to the earth by the weight of its name), is perhaps the best of all for our climate. But it is greatly to be feared that none of these are likely to prove vigorous. Probably they are hardy enough to endure the cold of our winters, provided they mature a healthy summer growth. The difficulty is with our hot, dry sun. On the estate of Mr. Hunnewell, where they have the benefit of shelter and moisture, they seem to thrive, and are superlatively beautiful. But, on the other hand, it is significant that in the nursery of the Messrs. Parsons, where the stock has been largely propagated for years, we do not find the plants get beyond the frames, into the open ground, to any extent. The general experience is, that they will require such careful nursing as will unfit them for common use.

An Azalea, also from Japan, called *mollis*, might also have been

called new some half dozen years ago, at least on this side of the water. But that has gone by, though the variety remains in its glory, and I am glad to modify my opinion that it was not hardy enough for open culture. Mr. Jackson Dawson informs me that it endures the climate at the Arnold Arboretum quite as well as the Ghent varieties, and flowers superbly. The Arboretum has a large number of seedlings raised on the grounds, from which we may expect plants every way adapted to our climate. This class is a very important acquisition, and will be likely, if further trial shall prove it to be hardy, to supersede the Ghent type, which, though fine in colors, has not the size and form of flower of the *mollis* type.

Still another Japan shrub is the Red Bud (*Cercis Japonica*), which differs from our American Red Bud or Judas Tree, in being very much more dwarf, assuming a bush form, and flowering profusely when less than one foot in height. Its tendency is to spread, and I should judge it would never attain a height exceeding a few feet. Its flowers are much larger and richer in color than those of *C. Canadensis*. The specimen which I exhibit was cut from a bush planted in the greenhouse six weeks ago, and is not, therefore, a fair example.

While we are upon Japan, I will mention the large class of evergreen shrubs, known as Retinosporas, or Japan Cypresses. Many varieties of this family are quite hardy in this section, if planted in soils and positions adapted to their wants. The old heath-leaved variety (*ericoides*) is not hardy with me, but *plumosa*, *plumosa aurea*, *squarrosa*, *filifera*, *obtusa*, *obtusa nana*, and *lycopodioides* have all endured exposed positions in my grounds. Though very diverse in form and foliage, they are of great importance for lawn decoration. Probably the golden *plumosa* and the silvery and dewy *squarrosa* would be singled out as most useful and contrasting.

Two years ago I had a row of Tamarix from this same Island of Japan, called *plumosa*. It seemed to me more hardy, and certainly was more erect and plume-like, and richer in foliage than the well-known Indian, African, and German Tamarixes. It so took the eye of one of our prominent landscape gardeners, that he secured the entire row before I knew what he was doing. I have recently learned from him that he lost the entire lot the first winter after planting. I do not regard this as a fair test, how-

ever, since we remember the killing effect of the early October freeze of that year, which was so destructive to many newly planted shrubs, though quite hardy.

Rosa rugosa, from Japan, a recent introduction, gives several shades of color in flowers, the dark red, called *rubra*, being, perhaps, the best. It is a large single flower, of much beauty when partly open, but the bush has great merit as a shrub, with dark, rich green foliage, very luxuriant in appearance, and crowned in winter with numerous scarlet seed vessels. It is a real acquisition.

I do not propose to take you around the globe and dwell as long in each country as we have in Japan. But suppose we take a single specimen from the inhospitable soil of Siberia, called *Cornus Sibirica foliis albo-marginatis*. This is undoubtedly a variety of the Siberian Cornus, but it may well be doubted whether the sport first occurred in its native habitat. It is probably a garden variety. At any rate, the variegation is very distinct light, with shades of pink in clear contrast with vigorous green, giving a lively appearance to the bush, which is very attractive. It is not as strong in growth as *Cornus sanguinea*, but is still vigorous, and has the same scarlet wood for fine winter effect. I regard it as a very promising shrub.

A new Plum from Persia, called *Prunus Pissardi*, has attracted a good deal of attention at French exhibitions during the past season. It is said to have "splendid foliage of a blood scarlet color, keeping so until the leaves fall down in November, the wood being of a brilliant black color." This is the description given by the introducer, who assures us "this is the finest novelty ever introduced, since a long time." I have not seen the variety, but the awards which it has obtained would indicate that it is worthy of trial. In habit it is said to resemble *Prunus triloba**.

In a row of Silver Bells (*Halesia tetraptera*) I noticed last summer a single plant, about three feet in height, which was as golden in color as the freshest piece from the mint. Of course it was conspicuous as far as it could be seen. I watched it with great interest. In September, I looked for it and it was gone. If I had it today, Mr. President, I would present it as the one specimen of a new shrub. But I fear it will be kept from public view; it is so distinct that it would betray the thief as certainly as a bank check.

*Specimens planted this season give promise that the description will be realized.

I do not regard the Weigelas with special favor, but the variety *candida* is pure white, and a decided improvement on the straggling growth of *hortensis nivea*, and a real acquisition.

Spiraea Thunbergii deserves general cultivation, because of its graceful habit and foliage, which is pretty enough for bouquets and table decoration. It bears a profusion of delicate white flowers which are the first of the season. *Spiraea aricefolia* is the most profuse flowering.

The Golden Elder is the most effective plant of this color.

The Purple Hazel is a strong contrast in dark color.

The Cut-Leaved Sumach (*Rhus laciniata*) contrasts strongly in its airy, fern-like leaves, which are very beautiful.

The Variegated Althæa is perhaps the best plant with white foliage. It is vigorous and striking.

Of the light, breezy, snowy-white *Exochorda grandiflora*, mention has frequently been made in our discussions, but not more so than the plant deserves. The same may be said of *Viburnum plicatum*.

The paniced species of *Hydrangea* is more upright in growth, and of better foliage than *Hydrangea paniculata grandiflora*. Many will also prefer the light trusses of bloom to the grosser masses of *grandiflora*. It is a question of taste, about which we may not dispute.

These varieties are named because they are of comparatively recent introduction, or have special merit and deserve a more extended cultivation. It is quite beyond our scope to allude to such old but admirable kinds as our native *Kalmia latifolia* and *Magnolia glauca*.

But I must not weary you with a longer list of favorites, although no mention has been made of dwarf species, Arbor Vitæ, and other evergreen shrubs of great value for lawn planting. We have a wealth of material, and with the aid of the knife we may increase the dwarf varieties almost without limit. For example, what tropical palm-like luxuriance may be produced by cutting the Ailanthus to the ground and securing new shoots every year or two. The Purple Beech is fine in color when kept as a shrub. Schwedler's and Reitenbach's Maples must be even better than the beech for this purpose.

A few words as to propagating.

The natural method is by seed, and it is the cheapest; but it is

also the slowest. Where we have plants that bear seed, and can give the time, we sow the seed. But if we are in haste with a new kind, grafting upon strong, congenial stocks gives a great gain in time. The rarest evergreens are multiplied with great facility and very quickly by this process. It is only necessary to start the stocks in pots, and when the sap is fairly moving, to side-graft the dormant scion, and then pack away in a shaded frame in the greenhouse, kept well moistened with sphagnum, and in a few weeks a skilful workman will show you a large per cent of well established plants. The grafting of deciduous shrubs is seldom practiced. They are oftener propagated from soft wood cuttings, taken in July and August, when the wood is in a half mature state. The cuttings are put into boxes having two or three inches of soil at the bottom, and a covering of one to two inches of fine sand at the top. In close, shaded frames, having a slight bottom heat, the cuttings will root freely, and be strong enough to pack away during the winter. The next spring they should be planted out, and will make stocky plants by autumn. A cheaper mode, and one which is effectual for many shrubs, is to cut the hard wood into proper lengths in the fall, then bury it in a dry soil in the open ground in bundles, bottom ends upward, then cover with boards to keep from severe freezing and thawing, and also to shed the rain. In the early spring plant firmly in carefully prepared garden soil. Of most varieties, a large per cent will make vigorous growth.

For those who cultivate plants in greenhouses, the easiest method is to take cuttings in February, March, and April, of the soft wood. These root readily in an ordinary propagating bed, and are ready to be turned out into the open ground in May to make strong plants by fall. Those who raise roses for winter cut flowers, find this last mode the most satisfactory. I have just been trying an experiment in feeding cuttings with a solution of cow manure, just as the callus is formed, and I am convinced that it induces the throwing out of strong, healthy roots, of more substance than we can get in pure sand.

May I say a few words in conclusion in favor of a more general use of shrubs for the adornment of suburban homes? They are peculiarly adapted to give the best effects at the least cost, and with permanent results. There is no danger that they will grow up to overshadow, and shut out air and sunlight and open views from our dwellings. Many of the coarser growing kinds are not

in keeping with our modern highly cultivated estates, and are to be relegated to the less conspicuous positions, for screens and wind-breaks. But there is left a long list of varieties, in all respects suited to the most cultivated positions, and one difficulty will be in making judicious selections. However much we may prize the flowering quality of shrubs, yet we are to remember that the flowers last, in most cases, only for a week or ten days in the year, and we desire something more than this brief enjoyment.

It is true that we have some shrubs which flower at periods of scarcity, like the *Clethra* and *Hydrangeas* in August, and the *Althæas* in September, and which would, therefore, be indispensable for that quality alone. The rose is also an example of such superlative excellence in bloom, that it can well afford to stake its reputation upon this one point. Still it remains true as a rule that we must seek for effect in form and in grace and luxuriance of foliage, as giving more enjoyment in the aggregate than the brief period of flowering. We must study to harmonize and heighten the effect of colors, of form, and of size. We have a greatly increased range of colors, from the white of the *Cornus* and the *Althæa*, the golden of the *Elder* and the *Spiræa*, the evergreen of the *Retinospora*, *Arbor Vitæ*, and *Yew*, and the vivid green of the *Forsythia*, to the dark shades of the *Berberry* and *Hazel*. What combinations of light and shade may be made with these materials! Again, we have great variety in size, and character of growth, from the softness of the most delicate evergreens to the rugose vigor of the *Japan Rose*. What combinations, what striking effects may be produced when these are used in harmony with each other, and with their surroundings! Judicious planting is a great art, but it is an art which insures a great and permanent reward.

DISCUSSION.

Charles M. Hovey, while agreeing generally with the essayist, differed from him in his estimate of the *Weigelas*. It is true that there is a sameness about them and that they are not equal to some other shrubs, but they are easily grown and cultivated. They are old, having been among the early introductions by Mr. Fortune. The *Exochorda* was introduced soon after, but is but little known. This and the *Viburnum plicatum* and *V. macrocephalum* were the results of Mr. Fortune's mission. The *Japan Cercis* is new and

most desirable for the size of the flowers and the dwarf habit. The essayist was right in his remark that the Retinosporas are one of the most beautiful classes of shrubs. It was well said by the late Henry Winthrop Sargent, that the time has gone by for Norway spruces and trees of similar growth, and that for lots of from a quarter or half an acre to an acre we must come to shrubs, which take but little room and do not crowd and shade. The flowers of the *Forsythia suspensa* are of a brilliant yellow, and appear very early in the season. With the aid of a knife the plants may be kept quite dwarf, or they may be grown into beautiful weeping standards. The Ailanthus may be made very effective in small grounds by cutting down the old growth and training up a single sucker. The leaves are almost as beautiful as those of palm trees. The lilacs are valuable for their dwarf habit. *Magnolia Halleana* is very desirable, as is also a black variety called *M. nigra*. There are many good old shrubs which we should not neglect, and new ones which have no particular value. The essayist has given us much valuable information in regard to propagation, but Mr. Hovey was surprised that he did not mention layers. The *Exochorda* may be propagated by cuttings of the soft wood and layers of the older wood. Modern invention has brought out many new methods of propagation. The Tree Pæonies were very slow in propagating, and consequently very high priced, until it was discovered that they could be grafted on the roots of the herbaceous species.

Jackson Dawson, gardener to the Arnold Arboretum, read the following list of new shrubs, with comments and descriptions.

Clematis coccinea is a herbaceous climber, growing from four to six feet high, and has small, very pretty, scarlet flowers, blooming all summer. It is perfectly hardy.

Clematis Davidiana is a beautiful suffruticose plant, with flowers of a porcelain blue, borne in clusters, from the middle of July to September, or later. Propagated by root cuttings.

Clematis graveolens is a very rapid growing woody climber, with light yellow flowers in August, followed by beautiful silvery winged fruit.

Clematis Pitcheri is a North American species, with pretty purple flowers, appearing from June to frost. This and the preceding species are easily propagated by seed, which they produce freely.

Magnolia stellata or *Halleana*, from Japan, grows two feet high, and flowers almost as soon as the snow is gone. It is propagated

by seed or layers, or by grafting on *M. acuminata*. It seems to be perfectly hardy.

Magnolia Thurberi has not yet flowered at the Arboretum, but will probably prove one of the most desirable varieties as to habit, which is neat and compact.

Magnolia Soulangeana var. *nigra* is a new variety, with very deep colored flowers.

Berberis Neubertii Hort. is one of the most promising shrubs as regards foliage, which is large and glaucous green.

Berberis Thunbergii has beautiful foliage, especially in autumn. The fruit is brilliant scarlet, and hangs on all winter, but is not edible. It seldom exceeds two feet in height. It is propagated by cuttings and seed.

Berberis Sinensis, recommended two years ago, has confirmed the opinion then expressed that it is one of the most desirable shrubs of its kind.

A *Berberis* sent as *Fortunei* is handsome in flower and foliage. It grows two feet high.

Hypericum Kalmianum, *H. prolificum*, and *H. aureum* (the last from the Mississippi), all have yellow flowers and bloom in the order named; the first, at the end of June, continuing through July. *H. aureum* produces its large yellow flowers until frost, and is the finest of all the *Hypericums*.

Hibiscus Syriacus variegatus. For a silver variegated leaf, this is one of the finest of all plants, and stands the summer sun without the slightest injury. Propagated by cuttings of hard or soft wood.

Actinidia polygama is a vigorous climber from Japan. The young shoots are of a pale brownish red, prettily speckled with ash colored dots. The flowers, in general appearance, resemble those of the pear. It is well adapted for covering an arbor.

Stuartia pentagyna is an old shrub, found in Virginia, flowering in June and July. The flowers are pure white, and resemble those of the Single White camellia, to which it is allied. It is propagated by seeds, cuttings, and layers, but is very difficult, and of slow growth.

Vitis (Ampelopsis) heterophylla is a very ornamental climber, especially in autumn, when it is covered with its fruit, which is yellow, white, purple, and blue.

Euonymus nanus is a pretty little dwarf evergreen, of very dense growth. It has scarlet fruit, about midsummer, similar to that of

the other species. It may be grafted standard high, or may be propagated by cuttings.

Euonymus alatus (the Wing-Barked Euonymus) is a small shrub with red berries, propagated by cuttings.

Euonymus verrucosus is a very neat dwarf shrub, with warty bark (as the name signifies), and bright red fruit.

Staphylea Colchica is tender at first, but hardy after a few years. It is propagated by cuttings of the young wood, or by layers.

Æsculus macrostachya (Dwarf Horse Chestnut) is a low growing species, with long spikes of pure white flowers, which are very effective. It blooms about midsummer. It may be propagated by seed or grafting.

Cytisus purpureus, is an old and valuable dwarf shrub, with purple and white flowers, appearing early in spring.

Cytisus nigricans has bright lemon colored flowers in summer. A very desirable small shrub, never exceeding a foot or a foot and a half in height.

Halimodendron argenteum blooms the last of June, and the flowers resemble those of the purple *Cytisus*. It does best grafted on *Caragana*, as it is rather a weak grower on its own root. The plant is similar to the *Caragana*, but the leaves are more silvery.

Amorpha canescens, or Lead Plant, is a very pretty native of Missouri, about two feet high at the most. Leaves downy; flowers deep purple, in long spikes, appearing about midsummer. Well worthy of cultivation.

Lespedeza bicolor is probably from Northern Asia. It blooms in June and July, and the flowers resemble those of the *Cercis*. It is perfectly hardy, but very difficult to propagate by cuttings.

Caragana arborescens (Siberian Pea Tree) grows from six to eight feet high, and has foliage similar to that of an acacia. In early summer it is covered with its yellow pea-shaped flowers. It is best propagated by seed.

Caragana frutescens var. *grandiflora* is propagated by root cuttings, but would make a better plant grafted on *C. arborescens*. The flowers are of a lighter yellow, and larger and more showy than those of *C. arborescens*.

Caragana spinosa is a curious species.

Robinia hispida, when grafted on *R. Pseud-Acacia*, grows more vigorously, does not throw up suckers, and flowers two or three times in the summer.

Dolichos Japonicus kills to the ground. It is a rapid climber.

Prunus pumila is found wild on our hill-sides. In cultivation it makes one of the neatest shrubs—prettier than *Deutzia gracilis*. It grows from a foot to three feet in height, and the flowers are white.

Prunus Japonica alba plena is old, but valuable. It does best grafted on the plum. The flowers are similar to those of the flowering almond, but snowy white.

Cerasus Watereri grows from six to eight feet high, and has very large double flowers, an inch and a half in diameter. It is the finest of all the double flowering cherries, and is propagated by either grafting or budding on the common cherry.

Spiræa millefolia is entirely new to cultivation. It was found in the dry districts of Nevada, and proves perfectly hardy. It grows three feet high and flowers in July and August; the individual flowers are half an inch across, white, and borne in spikes. Propagated by cuttings of the new wood.

Spiræa hypericifolia. The foliage is very pretty, having a glaucous tinge all through the summer. It is more desirable for the foliage than for the flowers.

Spiræa Thunbergii is well known, and now mentioned merely as one of the good things.

Spiræa betulæfolia is from California. It has pure white flowers in large round heads, the last half of May. It is propagated by cuttings.

Spiræa confusa var. *mollis* is the earliest of all the species. It is very free flowering; the flowers are white, with a slight tinge of yellow.

Spiræa Douglassii var. *Nobleana* has very large spikes of purple flowers, about the middle of June.

Spiræa Van Houtteii is a variety of *S. Fortunei*. It has very rich colored foliage, and fine, pearly-white flowers. It does not make a large plant, but is one of the best.

Spiræa salicifolia var. *Bethlehemensis* has deep rose-colored flowers in spikes like those of the type, from the middle of June to the first of August.

Spiræa salicifolia var. *Billardieri* is possibly an improved variety of *S. Douglassii*, with much more showy flowers.

Spiræa callosa var. *semperflorens* has flowers smaller and lighter colored than those of the type, and they continue nearly a month longer. They are borne in umbels.

Spiræa callosa var. *alba* is not as vigorous a grower as *S. callosa*, of which it is a white variety.

Neillia Amurensis is a vigorous growing shrub from Northern Asia, resembling *Spiræa opulifolia*, but the flowers are three weeks earlier, and much finer.

Exochorda grandiflora is well known as one of the finest shrubs, and one of the hardest to propagate.

Potentilla Salesovii is a shrubby cinquefoil, growing two feet high. It has large white flowers, and is propagated by cuttings.

Rubus deliciosus is from the Rocky Mountains. The flowers are pure white, of the size of an ordinary single white rose, and very showy. It may be propagated by seed, cuttings of the hard wood, or root cuttings.

Rosa rugosa alba is pure white, pretty, and desirable. The foliage takes a handsome color in autumn.

Rosa alpina glandulosa is the earliest of all the wild roses, flowering at the end of May, and a very desirable species. The wood is almost wholly free from thorns.

Rosa rubrifolia has rich deep purple foliage the whole season through, which, with its beautiful flowers, makes it a very desirable species. It is very difficult to propagate.

Rosa multiflora is one of the neatest of the wild roses, with pure white flowers, which have yellow stamens. It flowers from the first to the tenth of June. The fruit is ornamental, and hangs on all winter, giving it a very pleasing appearance.

Rosa setigera, one of the latest blooming of all the native roses, produces large clusters of light pink blossoms, and is very showy. It is probably the parent of the climbing Prairie roses of the gardens.

Rosa alba is one of the finest and purest of all the large white roses.

Rosa blanda var. *scropularia* is from the Rocky Mountains, and was received from Dr. Engelmann, the discoverer. It is very beautiful in bloom, and the fruit is perfectly magnificent — more beautiful than that of any other rose.

Rosa foliolosa has very light colored large flowers. It is dwarf, growing only a foot high, and the latest flowering of all the genus, blooming into July.

Amelanchier Canadensis (Shad-Bush or June-Berry) is one of the most beautiful native shrubs; it has snow-white flowers in June.

Amelanchier vulgaris (European) is a very pretty dwarf-growing species, quite similar to our *A. Canadensis*.

Amelanchier Asiatica is almost pendulous, and perfectly hardy.

Amelanchier alnifolia, from the Western States, grows from one to three feet high, and has very pretty white flowers and purple fruit.

Amelanchier—species from the mountains of Japan—is a very neat growing shrub and perfectly hardy, but has not yet flowered.

Malus Japonica (*M. Toringo* of some botanists) has semi-double flowers, appearing the last of May. They come out crimson, and change to rich rosy pink. This is one of the most desirable shrubs for a moderate-sized place. It may be budded or grafted.

Cydonia Japonica nivalis is a new, white flowering variety of the common Japan Quince. The flowers are large and pure white, and it is one of the finest additions to the varieties of this beautiful shrub.

Cydonia (Pirus) Maulei is a new species here. It has brick-colored flowers appearing with those of *C. Japonica*; smaller, but much more numerous. A very desirable shrub.

Ribes saxatile, from Northern Asia, has yellow flowers, and later is covered with rich orange and red berries. It is best propagated by hard wood cuttings.

Philadelphus hirsutus is a very pretty native species, well worthy of attention. It is dwarf in comparison with *P. grandiflorus*, etc. The shoots are slender and droop over, and are covered with pure white flowers, which appear about the first of July. It is best raised from cuttings.

Philadelphus variegatus is one of the neatest of the white variegated plants, and stands the summer well. Of very slow growth.

Philadelphus grandiflorus is known by every one.

Philadelphus microphylla, a native of Colorado, grows one foot high and has small foliage, one tenth of the ordinary size. It is a perfect little gem.

Philadelphus coronarius Schrenkiana, from Northern Asia, is one of the earliest varieties, and a dwarf growing kind.

Deutzia parviflora is from Northern China and Japan. The flowers are pure white, in umbels; they appear a week or ten days earlier than those of *D. gracilis*, and last till that is out of bloom.

Aralia Chinensis (*A. cordata*) has leaves almost as large as palm leaves, and would produce a sub-tropical effect. It is propagated by root cuttings.

Aralia pentaphylla is good. It is shrubby, with leaves as brilliant as those of the holly, but deciduous. Propagated by cuttings.

Cornus florida pendula forms a small tree, and will be desirable if it proves hardy here, which is somewhat doubtful, it being a more southern form than the type. It may be grafted or budded.

Cornus Sibirica. The great beauty of this species is in the wood, which is of vermilion color, and brightest in the coldest weather. It is easily propagated by hard wood cuttings.

Cornus brachypoda is a new Japanese species, which has not yet flowered, but is said to be very fine. The foliage and growth are somewhat similar to that of our *Cornus alternifolia*. It is propagated by cuttings or grafts.

Lonicera hispida is a very neat, low-growing shrub, with very pretty purple flowers, which appear in spring.

Lonicera Merrowii, from Japan, is similar to *L. Tartarica*. It is beautiful in both fruit and flower, bearing a profusion of berries, which hang on until September.

Lonicera Maximowiczii is probably an Asiatic species. It has pretty purple flowers, and fruit of a brilliant, glossy red, like that of a red currant. It is very difficult to propagate.

Viburnum Japonicum has large, leathery foliage; the leaves are from four to six inches in length. It has not flowered yet, but the foliage is very beautiful, and it is perfectly hardy.

Viburnum plicatum is too well known to need description. It has been considered difficult to propagate, but cuttings of soft wood, put in in July or August, under glass, root as easily as any shrub.

Viburnum macrocephalum has very handsome white flowers. It grows from three to five feet high, and is free flowering and very showy. Propagated by cuttings or grafts.

Viburnum rotundifolium resembles *V. plicatum*, but is very dwarf, and the leaves are smaller and not downy underneath like those of *plicatum*. The flowers are as white, and in similar heads, but earlier and smaller. From Japan, and hardy.

Viburnum Lantana, a European species, called there the Way-faring Tree, has been so long known here as hardly to need description. Soft, woolly leaves; white flowers in spring followed by black fruit. It is worthy of more general cultivation than it has received.

Viburnum lantanoides, known also as Moosewood, is one of our

handsomest native shrubs, with very large round leaves and pure white flowers. The fruit is brilliant red at first, turning to dark purple or black. The autumn foliage is very rich. It is seldom seen in cultivation, but ought to be.

Viburnum prunifolium is a very pretty native species, well worthy of cultivation. The same may be said of *V. dentatum*, *V. nudum*, and *V. lentago*.

Viburnum Opulus nana is probably a dwarf variety of the common Snowball, and is a very low, compact growing shrub, not exceeding a foot in height. It is very desirable for an edging, or wherever a low shrub is needed.

Erica carnea, grows less than a foot high, and is one of the hardiest of all the *Ericas*. It flowers early in the spring, as soon as the snow leaves the ground. There is also a variety *alba*.

Andromeda polifolia is a very pretty glaucous leaved shrub, a native of Massachusetts and northward. The flowers are pink, changing to white, and produced in May.

Andromeda Japonica is a lovely evergreen, but wants to flower too early, and should be shaded.

Oxydendrum arboreum flowers in August and September. It is difficult to propagate. The foliage turns to a beautiful purple in autumn.

Kalmia latifolia and *K. angustifolia* flower in June and July. They are well known as beautiful native shrubs, which ought to be in every collection.

Rhododendron Catawbiense. In June, the top of Rown mountain, in North Carolina, is covered, by hundreds of acres, with this beautiful shrub, like one vast flower garden.

Rhododendron maximum is our well-known hardy species, and the latest flowering — almost a month later than the others. A vigorous grower, with pale pink flowers.

Rhododendron punctatum is a very pretty little species from the Western territories. The flowers are deep rosy pink, with dark purple or maroon spots. It is not quite so hardy as the other species.

Azalea nudiflora is a native species, with very pretty, fragrant pink flowers, produced in May.

Azalea viscosa is another well-known native species, with very fragrant white flowers in July.

Azalea calendulacea is a native of the Middle and Southern

States. The flowers vary from pink to yellow in many shades. They appear in June.

Azalea arborescens is from North Carolina, and grows from fifteen to twenty feet high. The flowers are almost pure white, with scarlet stamens, and come after those of all the other species are gone.

Azalea mollis is one of the finest and hardiest of all the species. The flowers, which are in all shades, from salmon to yellow, are very nearly equal to those of the Indian azaleas.

Ledum latifolium grows a foot and a half high, and flowers in May. It is found in the mountain regions of the Northern States. It is a very pretty shrub, with pure white flowers.

Clethra alnifolia, our native species, is well known, and easy to handle.

Clethra Japonica has not flowered, but is said to be better than the above. It is difficult to propagate.

Styrax Japonica flowers very freely in June and July. The flowers are pure white, and resemble small Halesia flowers. It is propagated by cuttings of the young wood. At the Arboretum it has winter-killed somewhat; but at the Botanic Garden, in Cambridge, it stands perfectly.

Symplocos sp. is from the mountains of Japan. It has very fine sprays of white flowers, and is perfectly hardy.

Lycium Chinensis has fine berries, which hang on after the frost has killed the leaves. They are larger and more showy than those of the European species.

Forsythia suspensa, when trained in tree form, with the head drooping, is one of the most beautiful objects in the garden in early spring. It is easily propagated by hard or green wood cuttings.

Syringa Sinensis alba is a very pretty early white flowering variety, from China.

Syringa ligustrina, from the mountains near Peking, China, has not yet flowered, but promises well.

Syringa pubescens, grows from a foot to a foot and a half high, and has white flowers and fine large leaves, which, with its very dwarf habit, make it a plant of great promise.

Syringa ovata, has not yet flowered, but the appearance of the plant is grand; leaves large, heart-shaped, with a bright, rich, glossy surface, and holding on through the summer.

Syringa sp. The seed was brought by President Clark, of the Massachusetts Agricultural College, from Japan. The plants are eight feet high, and still growing vigorously, and are of fine form and habit and promise to make small trees. They bear large spikes of white flowers after the other lilacs, even the Josika, are gone.

Ligustrum Ibotæ, or Japanese Privet, is a dwarf shrub, probably never exceeding three or four feet in height. It bears pretty little white flowers, almost completely covering the bush in July; the spikes are drooping instead of erect. It is entirely distinct from all the other privets.

Daphne Mezereum, though an old plant, is seldom seen. It blooms soon after the snow is gone, and the pink flowers are succeeded by pretty berries, which must not be eaten, as they are poisonous. There is a variety with white flowers, and also a double white. It is propagated by seeds or root cuttings.

Eleagnus argentea grows from three to four feet high, and has silvery foliage. It is well known to be diœcious, and to have fruit both sexes must be planted. It is very hard to propagate, but root cuttings are best.

Eleagnus longipes flowers in May. The fruit is orange colored, and very agreeable to the taste. It is sold in the markets of Japan.

Mr. Dawson concluded with the remark that among our own native shrubs are varieties more worthy than two-thirds of those imported.

Hon. Marshall P. Wilder said that Mr. Strong's paper and Mr. Dawson's list, afford more information on hardy shrubs than has ever been presented at any other meeting. He had endeavored to keep abreast of the age in this as in other respects, but, like Mr. Hovey, was surprised at Mr. Strong's low estimate of the Weigela. He thought it would be hard to fill its place in our shrubberies. The variety with variegated foliage is far more beautiful than the variegated Althæa, and is never injured. He asked whether the Paulownia did not transcend the Ailanthus in beauty when headed down every year or two, as advised for the Ailanthus.

Mr. Strong thought that our climate would not allow us to cultivate the Paulownia as recommended for the Ailanthus, though it might do. There are two or three varieties of variegated Althæas, one of which is more beautiful than the variegated Weigela. He

did not speak of layering as a method of propagating shrubs, because that, as a rule, it is not suitable for them, being apt to make one-sided plants, but it is well adapted to propagating vines. The *Stuartia* is not hardy with him.

Mr. Dawson said that he had cultivated the *Stuartia* in the open nursery without protection, and had seen it on a gravel knoll at Mr. Parkman's, and on the edge of an azalea border, and never winter-killed.

Mr. Hovey said that the *Stuartia* is hardy with him.

Mr. Wilder's experience with the *Stuartia* was like Mr. Strong's; he had got plants several feet high, but never could make it flower. The *Paulownia* dies down, but sends up magnificent shoots; he had had one fourteen feet high. He had had the *Azalea mollis* for twelve or fifteen years, and it is as hardy as his pear trees. It is a magnificent acquisition, with its vivid orange and yellow flowers. He has crossed it with the Chinese species, and the seedlings have stood out for two years. The *Magnolia Halleana*, with double white flowers, is a very fine acquisition. Nothing eclipses the *Hydrangea paniculata grandiflora*; he cut the flowers before frost and put them in water for a few days, and they were as handsome at the time of speaking as when cut; it is an everlasting flower. He advised to hold fast to the good things, new or old.

Mr. Dawson said that there are two species of *Stuartia*; the *Virginica* is tender, while the *pentagyna* is hardy.

Col. Henry W. Wilson thought the directions given in regard to propagating, both valuable and interesting, as teaching people how to get shrubs easily. We are in danger of overlooking our native shrubs, such as the beautiful *Kalmia*. Every one can have a border of native shrubs. The High Bush Blueberry is easily cultivated, and beautiful both in spring and autumn. He has a plant eight feet high, which is a mass of fruit in its season, and supplies his family with more than all they want. It combines utility with beauty.

Benjamin G. Smith said that he has a hedge of the high blueberry, which is one of the most interesting features of his garden. The plants were removed from the borders of Fresh Pond to the most elevated location in Cambridge. He gives them an annual dressing of peat.

Mr. Wilder said that the high bush blueberry wants a good deal of water.

Col. Wilson said that some varieties do not require much moisture. He had seen a plant flourishing on a dry hill-side.

Mr. Wilder said that hill-sides are often well supplied with springs.

Mr. Dawson said that he knew a place where the high bush blueberry grows from one to six feet high in almost pure white sand.

William H. Hunt said that there are a number of varieties of the blueberry. One has a very low bush, about six inches high, and the fruit is very sweet. Another grows about two feet high. The high bush blueberry usually grows in swampy ground. A neighbor had a bush from which he picked a peck, and Mr. Hunt picked nearly a peck more. This was not in a wet soil, but one only moderately so. There were several stems to the bush.

Caleb Bates thought that the blueberry had been much neglected. The great variety in the fruit would indicate that improvement might be made. He remembered a bush on a dry hill, where the roots ran under a building, which bore a great quantity of fruit. The "Fruit Recorder" mentions a bush with berries five-eighths of an inch in diameter. Sometimes they grow fifteen or twenty feet high.

Mr. Dawson said that the Low Blueberry is *Vaccinium Pennsylvanicum*. The next dwarfest, with larger, coarser foliage and darker colored fruit, a week or ten days later, is *V. corymbosum* var. *amcenum*. *V. vacillans* grows from one to two feet high, with glaucous leaves, and the fruit is produced in bunches on the ends of the shoots. The common High Bush Swamp Blueberry is *V. corymbosum*.

C. M. Atkinson said that next to possessing shrubs is the knowing how to use them. He condemned the practice of cutting year by year so as to form a balloon shaped bush. The knife should be used judiciously so as to keep them within bounds. One of our horticultural periodicals has repeatedly recommended the shortening of all shrubs in the spring, which is especially injurious to the Philadelphus and others which bloom on the last year's growth, if flowers are desired.

Warren H. Manning thought that peaches form the blossom buds the year before, and the Philadelphus on the new wood.

Mr. Dawson said that the bud is made the year before on the Philadelphus as much as on the peach, but in the former the flower is developed later.

J. W. Manning had found it necessary to keep *Retinosporas* pruned, to have good foliage.

Mr. Atkinson advised training the *Forsythia suspensa* to a single stem, with a large head, and cutting back as soon as it is out of flower.

E. H. Hitchings was glad to hear Mr. Dawson say so much in favor of native shrubs. The *Ledum latifolium*, which Mr. Dawson spoke of as growing on Mount Washington, the speaker had found in Concord, with *Andromeda polifolia* and *Kalmia glauca*. It is very fragrant. *Leucothoë racemosa*, when exhibited here by the speaker last year, was thought by the Flower Committee more beautiful than *Andromeda floribunda*.

Mr. Dawson said that the *Leucothoë* does as well on high ground as the high blueberry.

It was announced that on the next Saturday, William H. Hunt would speak on the "Cultivation of Hardy Grapes."

BUSINESS MEETING.

SATURDAY, February 24, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The President, as Chairman of the Executive Committee, to which the subject was referred, reported, recommending that the TRANSACTIONS of the Society be sold to persons outside of the State at the rate of two dollars per year. The report was accepted and adopted.

Hon. Marshall P. Wilder announced the decease of Hon. Paul A. Chadbourne, D.D., LL.D., President of the Massachusetts Agricultural College, and moved the appointment of a committee to prepare memorial resolutions. Mr. Wilder spoke of Dr. Chadbourne as deeply interested in everything appertaining to the culture of the soil or the welfare of mankind, and as a man of science and a promoter of religion. In fitness for the head of

such an institution as the Agricultural College he had no superior, and his loss to it is an irreparable one. He had visited our rooms and expressed deep interest in the welfare and progress of the Society. The motion was carried, and the Chair appointed Mr. Wilder, William C. Strong and John B. Moore, a committee to prepare memorial resolutions.

Adjourned to Saturday, March 3.

MEETING FOR DISCUSSION.

THE CULTIVATION OF HARDY GRAPES.

William H. Hunt, who had been appointed to lead the discussion, said that twenty-five years ago we should hardly have thought of discussing the subject. Then no cultivation of hardy grapes existed. The only variety grown was the Isabella, and no one thought of cultivating it on an extensive scale, and no one had any faith in it. Mr. E. W. Bull, by raising the Concord, proved that it was possible to improve the wild varieties, and make cultivation profitable. The Concord was only one step in improvement, but certainly a very wonderful step. Mr. Bull's success led others to attempt the improvement of the grape, and the number of varieties now introduced is very great, and there seems to be no limit to the possible improvement.

The grape is one of the most healthful, as well as delicious fruits. Every one can eat them; and, in Germany, grape cures have been established for invalids. Our chief fruit crop is the apple, but it bears only once in two years, while the grape bears every year, with seldom a failure. The speaker had been growing grapes for twenty years, and never had any vines killed except in one year, when he lost as many pitch pines, and he had failed of a crop but one year, when he had half a ton instead of five tons. He had cut down vines and cultivated four or five years, and still the roots threw up shoots. Grape vines do not require rich meadows, but can be grown on poor hill-sides and other land not adapted to general farming.

Guyot states that the colonizing power of the grape is three times greater than that of wheat. On poor lands he estimates the annual product of a farm in grain and pasture at \$20 per acre per

year, and of vineyards at from \$48 to \$192. In Champagne, the average yield is 290 gallons, worth 50 cents per gallon, or \$145 per acre. The same land in grain would yield but \$22. The average profit is about \$60 per acre for the best wines, and \$30 for those of second quality. If we go into the cultivation of grapes in this country, we can produce an immense quantity. The number of acres in vineyards in Europe, in 1878, was 14,000,000, producing 22,832,000 tons of grapes, and 3,806,200,000 gallons of wine (or 272 gallons per acre), worth, at 25 cents per gallon, \$951,300,000. In France, there were 5,500,000 acres of vineyards, producing 9,000,000 tons of grapes, and 1,505,000,000 gallons of wine, worth \$376,000,000. The population of France is 38,000,000, so that there were nearly 500 pounds of grapes to each inhabitant. The product of wheat was 229,000,000 bushels. In the same year, the United States produced 1,378,000,000 bushels of corn, worth \$441,000,000; 448,000,000 bushels of wheat, worth \$326,000,000; 5,500,000 bales of cotton, worth \$200,000,000, and 30,000,000 gallons of wine, of which 10,000,000 gallons were produced in California. The population of the United States is 50,000,000, and the area 3,000,000 square miles. The size of France is 206,474 square miles. The area of Texas is greater than that of France; and California contains more acres suited to the cultivation of the grape than France. Grapes require a large amount of labor which never can be done by machinery, but can be performed by women and children.

Mr. Hunt next considered whether the cultivation of the grape can be made profitable in Massachusetts, and thought that it could be if properly attended to, with sufficient knowledge. The grape will survive neglect, but it does not pay to neglect it. If a vineyard cannot be properly cared for, it would be better to cut it down. Grapes want a dry soil, and an elevated situation should always be chosen for a vineyard. The ground should be properly prepared by ploughing thoroughly, but not very deeply. It should be furrowed out where the vines are to be planted, to save the expense of digging holes. The distance apart of the vines depends on the system of training and pruning to be adopted. If they are to be trained to stakes, they should be eight feet apart; if a trellis is used, the rows should be ten feet apart, and the vines six feet in the rows. On stakes, two arms are trained, and they are pruned on the spur system. On trellises, both the spur and renewal system are used. The system is not of the first importance; the vine

will accommodate itself to any. The grower should know how much fruit and foliage to retain. Overcropping must especially be avoided, and one can only learn by experience how much fruit a vine will carry. This is a matter of the first importance; for if a vine is overtasked, it is not only weakened for future years, but the excessive crop will be late in ripening. In California, the main cane is grown three or four feet in height, and no stake or trellis is used, but the shoots are allowed to hang down. In Italy, vines are allowed to run on trees; chestnut trees are planted for this purpose, and when they have grown to a large size, canes twenty feet long will run from one tree to another. In Germany, the bow system is used. Every section has a different system. That pursued by Dr. Fisher, of Fitchburg, who has been very successful in the cultivation of the native grape, is being introduced. This is the renewal system, where a cane which has fruited is cut off in the fall, and replaced by one which has been grown for that purpose. The speaker has used stakes with two shoots coiled around them. In this method great care is required to prevent too much growth at the top. Other crops can be grown between the vines for two years, during which time but few grapes can be expected, but after that time the roots will be well established, and no other crop should be grown on the land, but thorough and clean cultivation should be practised. The speaker prunes at any time in the winter, and had also pruned without injury when the vines bled. He had tried them without pruning for one year. Summer pruning or pinching the young shoots is important to restrain the growth of the vine, and prevent it from running to wood at the expense of the fruit. Only experience will tell how much to take off in pruning.

There is a great difference of opinion in Europe in regard to the use of manure for vines. Guyot states that in some of the best wine districts they are afraid to use stable manure, lest it should injure the quality of the wine, and that, where it is necessary, it is put on after the vintage. At Thomery, where the best table grapes are produced, the vines are manured liberally every three years. At Johannisberg, cow manure is used freely, and the director thinks that it improves the quality of the wine. The grape does not require a great deal of manure — not twenty-five cords per acre, like the market gardens of Arlington — but, like all flowers and fruits, it needs a soil so prepared as to be adapted to its

wants. Stable manure, if used, should be rotted down. Mr. Hunt had used bone and ashes as the cheapest manure; he would have used stable manure if cheaper. The rose-bug is an enemy that every grower has to contend with. The speaker had not tried covering the bunches with bags, but would have done so if he had had only a few vines. Small growers have as many rose-bugs as large ones, but there are not so many near forests as in the open country.

Hon. Marshall P. Wilder agreed with the practical statements made by Mr. Hunt, especially in regard to the value of the Concord grape, the capacity of our country for producing grapes, and the excellence and necessity of the fruit. No other fruit, except perhaps the strawberry, is now attracting so much interest as the grape, and none, if we except the apple, is of more importance as an article of luxury for our tables. No other country possesses such a vast extent of territory, or such possibilities and probabilities for its successful culture, as our own, embracing as it does twenty-five degrees of latitude, and a breadth of longitude from the Atlantic to the Pacific shores. Wherever our wild species will grow in any part of our immense territory, there other improved varieties will succeed. The field for progress is absolutely without limit. Mr. Wilder said that when, in his address before the American Pomological Society, in 1860, he predicted that the grape would be successfully grown in every State and Territory of our Union, and that the fox, or native flavor, then so much objected to, would, by the art of hybridization, become so modified and changed as to constitute one of the most excellent characteristics of our grapes, and give them a superiority over such varieties as the Black Hamburg and Sweetwater, and other foreign kinds, which are destitute of any special aroma, the prophecy was considered not only improbable, but the aspiration of a young and ardent disposition. The time has, however, now come, and he has lived to see it, and now confidently believes that this flavor thus modified will give us seedlings which will rival the Muscats and Frontignans of the old world.

Few are aware of the great extent of vine planting in our country. No sooner does a new variety of excellence appear than it is seized on and planted extensively. Such is the case with the Niagara grape, of which there are vineyards of from ten to fifty acres each, and so the cultivation of the grape will continue to in-

crease, until every section of our vast territory shall have varieties adapted to their several localities. Great progress has been made in grape culture since the establishment of this Society, when the only varieties of American grapes in our gardens were the Isabella and Catawba. Now we have numerous varieties of established excellence, but these are only the harbingers of the host of improved kinds which are to succeed them in coming time.

Mr. Wilder closed by naming the following varieties of grapes as possessing valuable characteristics :

Early: Moore's Early, Worden, Early Victor, Niagara.

Well established: Concord, Delaware, Brighton, Eumelan, Barry, Martha, Lindley, Wilder.

White: Martha, Lady, Prentiss, Pocklington, Niagara, Francis B. Hayes.

Of refined and superior flavor: Brighton, Lindley, Iona, and others.

Josiah W. Talbot had long felt that grapes are not only important but essential in every family. They can be grown by every one who has a rod of land. We need a certain amount of growth, and if we manure to exceed that, we lose by it. On rich land the vines are stimulated to make too much wood, instead of fruit. He recommended turf mould with a little ashes and bone as a fertilizer.

J. W. Manning said that in 1849 he was foreman in Samuel W. Cole's nursery, in Chelsea. In 1847, Mr. Cole got cuttings from the original vine of the Diana grape, and offered plants for sale in 1849. In that year, Mr. Bull came to the office of the Boston Cultivator, which Mr. Cole then edited, and told him he had a new and promising seedling black grape, and exchanged a plant of it for one of Diana. This plant was set out by the speaker, and soon fruited, but little account was made of it. It was not to be propagated for sale, and in the spring of 1853, Mr. Bull took the limited stock that had been propagated, and it was sent out under the name of Concord, in the spring of 1854.

C. M. Hovey said that the Diana was first exhibited before this Society in 1843. It was late in the season, and it was seen only by him and a few other persons. Samuel Downer, Senior, went to Milton to see the vine, and thought it the Catawba. Mrs. Crehore, in whose garden it originated, sent cuttings to Mr. Hovey, who cultivated it and sent it to A. J. Downing, by whom it was noticed

in the Horticulturist. Mr. Hovey found that it differed from the Catawba. The Concord was exhibited before this Society in 1853, and introduced for Mr. Bull by Hovey & Co., who sent out the first plants in 1854, when it attracted much attention, and still more in 1855. The Pocklington and Martha are descended from it. In 1854, the Isabella, Catawba, Diana, Hartford Prolific, and Delaware were the only good grapes known.

Mr. Hovey said that there is a difference between the cultivation of the grape for wine and for the table. For the latter we want large grapes, and more manure may be used; but for wine we want to get rid of the water. In France, vines are planted three feet apart each way, and this method was attempted in Cincinnati, but though they were not planted so closely, it was found that our native grapes would not submit to the severe pruning necessary. William J. Flagg speaks of twenty-two thousand vines being set on an acre in France. In that country, very little manure is given when the grapes are wanted for wine, but for fruit a greater quantity is applied, in proportion to the condition of the land. Mr. Hovey agreed with what Mr. Wilder had said of the importance of working out the fox flavor in our native grapes, and leaving the aroma which makes the Brighton and others so delicious, though he did not think we should produce anything to equal the Muscat of Alexandria.

William C. Strong said that though fully aware of the value of the Concord grape, he thought Mr. Hunt had stated it too strongly. It is far inferior in quality to either the Isabella or Catawba, which were cultivated here with success before our climate was unfavorably modified, as was also the foreign grape out of doors. Among the difficulties in growing grapes here, one is the competition of more favored climates. Varieties ripening before the Catawba are produced here at a loss. The Concord was an advance on the Isabella in earliness, and the Worden and Moore's Early have made still greater progress in the same direction. The Early Victor promises to be a great gain, and the Lady looks like a valuable acquisition for New England. The last is an iron-clad, and that is what we want. The speaker doubted the value for market of many of the new comers. The Lady Washington and Duchess may succeed in gardens. He thinks more and more of the Delaware; when it attains age it resists mildew. It is exceedingly productive, but cannot be produced as cheaply as the Con-

cord. It had been a question with him whether he could meet the rose-bug. If it continues to increase as in the last two or three years, it will become an evil of serious proportions, but he believed we can meet it. He had tried bagging; it is effectual, though involving much labor; but any care that will produce superior fruit will pay. The *Spiræa sorbifolia* attracts the rose-bug, and it is easy to shake them from it, but difficult to shake them from the bunches of grapes.

John B. Moore said that the grape crop is more certain than any other of the large fruits, even the apple. In a good location, we can be sure of a crop four years out of five, even with the rose-bug. He understood by a hardy grape, one that would stand twenty degrees below zero without laying down, and though he did not object to others, he thought they should be described as half-hardy. He did not advocate any particular plan of pruning, but any one that would fill the trellis with medium sized, mature young wood, is a good one. If the Concord is cut back to a single bud, besides the small one at the base of the shoot, half the time the bud left will be only a leaf bud, and varieties of this character should therefore be pruned longer. Mr. Moore thought that in some varieties he could distinguish the fruit buds from the leaf buds. If too many shoots are produced from leaf buds, they may be rubbed off when six inches long. He trains both on trellises and stakes. For trellises he uses posts eight feet long, set three feet in the ground, and the end posts braced. Three hundred feet will require twenty-two posts besides two for braces, costing seven cents each, delivered. They are of chestnut, not less than four and a half inches in diameter at the smaller end. The setting will cost \$1.32; sixteen pounds of No. 14 galvanized wire, eighty feet to the pound, \$1.44; and stretching the wire fifty cents, making a total of \$4.94. This is the cheapest method of training. If the lines were only a hundred feet long they would cost \$1.65, besides the two extra posts for bracing. If stakes were used, eighty-four would be required, costing six cents each, and \$1.50 for setting, making \$6.54. The trellis would not only be cheaper, but would last longer. The arms do not get loose on a trellis. He had trained somewhat on Dr. Fisher's plan, one arm being left long to bear this year and be cut away and replaced by another next year. Every other vine occupies the two upper and two lower wires. He had found difficulty in fruiting an arm left too long, and thought

Dr. Fisher might have over fertilized. The crop depends not so much on the amount of wood, as on good, well ripened wood. If properly pruned, it will mature a better bud. For market, he wants large bunches, for they sell better, and if the berries are large there is less exhaustion to the vine from maturing seeds, for there are not so many in a pound of grapes. If vines are trained on stakes it is necessary to coil them, to check their growth, and even then the flow of sap is not so uniform. He places his trellises nine feet apart, so that he can go between them with a cart, and the vines six feet apart on the trellis. If stakes are used, you can go between them either way with the cultivator. We want as much sun on the ground as possible, and we get more with stakes than with trellises. On trellises, the fruiting shoots must be tied up, but on stakes, this is not necessary. On stakes the fruit chafes in the wind and rubs off the bloom.

In regard to insects, the rose-bug (*Macrodactylus subspinosus*), which is one of the most troublesome, comes out of the ground the second week in June, and lasts thirty or forty days. The male then dies, and the female deposits about thirty eggs in the ground, from which the larvæ are hatched in about twenty days. They grow to about three-quarters of an inch in length, and the last of October go below the reach of frost and there winter. As soon as it thaws, they come up near the surface, and work round in the earth so as to form a cell in which the larva changes to a chrysalis. It will be seen that they cannot be reached in the egg, larva, or pupa state, and that there is no way to destroy them except by picking. As long ago as he could remember, he saw them as thick as they are now. In 1823, John Lowell described an apple tree as covered with them so thickly that destruction by hand was out of the question, and he spread sheets under the tree and shook them down and burned them. Dr. Green, of Mansfield, found eighty-six on a single rose-bud, which were crushed with one grasp of the hand. A steel-colored bug (*Haltica chalybea*), eats the germ of the bud, and seems to know when any one is coming after him.

Mr. Moore thought it is not desirable to use animal manure for grapes, and he has to be careful even with bone and ashes. They do best on poor land. He has several acres of grapes which have had no manure.

Mr. Talbot said that he picked the rose-bugs as long as one remained.

It was announced that on the next Saturday the subject would be "Strawberries and their Culture," by Hon. Marshall P. Wilder.

BUSINESS MEETING.

SATURDAY, March 3, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President BENJAMIN G. SMITH, in the chair.

N. B. White moved the following Vote: That all specimens of fruits exhibited for the Prospective Prizes, be weighed and measured; pears, apples, etc., single specimens; currants, grapes, etc., the cluster and individual berries to be measured to ascertain the diameter of the same.

The vote was referred to the Fruit Committee.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

SEWALL FISHER, of Framingham,
WILLIAM B. DINSMORE, of New York,
ALFRED W. SPENCER, of Dorchester.

Adjourned to Saturday, March 10.

MEETING FOR DISCUSSION.

STRAWBERRIES AND THEIR CULTURE.

By Hon. MARSHALL P. WILDER, Dorchester.

The strawberry is one of the most capricious plants with which I am acquainted. A variety may do well in a certain locality, and in another not far distant, may be an entire failure. There are some varieties, as of other fruits, such as the Baldwin apple, the Bartlett pear and the Concord grape, that are adapted to a wide extent of territory. Such is the fact with the Wilson strawberry, which is starred on the Catalogue of the American Pomological

Society for thirty-five States and Territories, while no other has more than twenty-eight stars. We must, therefore, study the characteristics of our soils, locations, and climates, and select such varieties as are best adapted to them. The acclimation of tender, or half-hardy plants, is a fallacy, and we shall at last be forced to rely on the fitness of things to the conditions in which we live.

Strawberry culture has assumed a rank of great importance in our fruit gardens. Great progress has been made in the introduction of new and fine kinds, but there is still room for improvement. Improvement is the destiny of our race. The instincts of nature, whether we believe in "evolution" or not, are all in the line of improvement. So it is with the fruits of the earth, and I know of no reason why we may not produce strawberries of the finest quality, and such as are adapted to every section of our vast territory.

To produce improved varieties, we should select as breeders, those that possess the characteristics we wish to obtain. To make sure of a perfect cross, I have chosen pistillate or female kinds, and impregnated them with those of the greatest excellence. As an illustration, I have taken the Crescent, although of second quality, as a female parent, on account of its extraordinary hardiness, productiveness, good form and color, and have crossed it with the President Wilder, Hervey Davis, Duncan, Triple Crown, and other high flavored, well formed, and good colored varieties. From these, and other crosses, I have obtained some very promising kinds, which I hope to present for your examination the coming season.

The time is fast approaching when the public will not be satisfied with so poor a strawberry as the Wilson, and if we can produce a better one, it will disappear from our markets. If we can produce another here of the quality and productiveness of the Hovey, in former years, and better suited to general cultivation,—and we can,—should we not do it? What we want are varieties of excellence that everybody can grow.

In regard to culture, I have to say, that the strawberry plant is a gross feeder, and without a well prepared soil, an abundant supply of proper food, and at the proper time, no great success can or ought to be anticipated. We should not plant on land which has for some years been occupied with the strawberry, and should manure and prepare most thoroughly before planting; give a good

top dressing immediately after the fruiting season, and repeat this in the spring, being very careful not to disturb the roots. Well rotted stable manure is good; ground bone and wood ashes, or, as a substitute, muriate of potash, are excellent fertilizers, and these are all the better if composted with soil or manure, and allowed to heat before using. In this climate, the spring is the best time for general planting. But when all the prerequisites are secured, we have often to contend with the heat and drought of summer, which are the most formidable of all difficulties. No plant in its fruiting season is more benefited by a constant supply of water than the strawberry, and I repeat my former advice, "Give the strawberry water! water! water! and still a little more water." We cannot control the clouds. If I were to grow the strawberry on a large scale, for market, I would certainly provide the means of irrigation, so that water might be given when it is needed.

Some varieties require to be grown in hills, and to have the runners cut off as soon as they appear; such are the Sharpless, Bidwell, and Triomphe de Gand. Some are pistillate varieties, and require to have the bisexual kinds planted near by, and be in bloom at the same time. Such are the Hovey, Crescent, Jersey Queen, and Manchester. For the want of proper impregnation, these kinds often fail of a good crop, but with a suitable companion, the pistillate varieties produce very large crops, as did the Hovey forty years ago, and as, if I mistake not, Mr. Hovey will show us that it can do now.

Some varieties produce a large number of trusses, and give promise, when in bloom, of extraordinary crops, but do not yield so much as those of less pretentious appearance. The truth is, there is a limit to the power of production, and where there is a superabundance of trusses and flowers, only a portion will set their fruit and carry it out to perfection, without excessive stimulation. Another cause of failure may be traced to a deficiency of pollen on some of the bisexual varieties, and it is well to plant near them also, such as are furnished with an abundance of it.

Among the varieties which are taking the place of the Wilson, and other inferior kinds, is the Charles Downing. Although not quite firm enough for long transportation it is, for home and near markets, assuming a prominent place for general cultivation. While the Wilson, which has been known for twenty-five years, or more, has added on the Catalogue of the American Pomological

Society only three stars in the last eight years, the Charles Downing, a more recent variety, has added four times as many in the same period, and stands to-day second for cultivation on the list of forty-one varieties. This variety blights in some seasons, but it has never done so with me for fifteen years, and there is no variety with which I am acquainted, of equally good quality, which is now so generally cultivated.

As to the system of planting, I need say but little before so many skilful cultivators. For garden culture, I like the method of planting in rows three feet apart, with plants one foot in the row, allowing each to make from two to four shoulder runners, and no more, for the first season. These, by autumn, will constitute a thrifty row of strong bearing plants, and will produce more than the common matted beds. For field culture, I would plant in rows four feet apart, and a foot apart in the row, and where wide beds are allowed, it will be found of great benefit to pinch off all superfluous runners, so as to have none but strong plants. The degeneracy, or wearing out of varieties, as it is called, I think may often be traced to the exhaustion of proper elements in the soil, and to bad manipulation of the plants. The strawberry should not be grown on the same soil for more than two or three years without an intervening crop. Give it fresh, rich soil, and use strong uniform plants, and we shall hear but little of the running out of varieties. In our rage for novelties, such as are described as "the best in the world," we meet with many disappointments, and sometimes become disgusted with their failure, and cast them out as worthless kinds, without a fair trial. So with some of our old kinds which have not been so much cultivated lately as in former years, such as the Hovey, Jucunda, Triomphe de Gand, and others which were once popular. It would be, I think, a wise measure for this Society to offer a special premium for the restoration of those old valuable varieties of fruits and flowers which have gone out from general cultivation.

Among the new varieties of the strawberry now being promulgated as possessing extraordinarily good characteristics, are the Manchester, Jersey Queen, Iron Clad, James Vick, and Big Bob (pardon me for uttering that vulgar name), and should any one of these varieties come up to the merits claimed for them, we should need no other kinds. But, my friends, we have not yet arrived at the summit of perfection with the strawberry or any other fruit. Let

not what I have said prevent you from testing these new varieties. Plant! plant! plant! prove all things and hold fast to those which are good. We are still in progress. The field for improvement is immense, and with the appliances of cross-fertilization by human skill, its limits are almost without bounds.

DISCUSSION.

Charles M. Hovey was called on by the Chairman, and said that the remarks of the essayist on the necessity of sustaining the reputation of the old varieties, were well put. Many are passed over by the majority of cultivators, and afterwards some cultivators will discover their merits. An old variety may in this way be supposed to be new, and may receive a new name, and hence the immense number of synonymes, not only of strawberries but of pears, grapes, and other fruits. Some strawberries have as many as fifteen synonymes in Europe, and we have had a few here. The Champion and Black Defiance are said to be identical. A variety found in Connecticut and sent out as new, proved to be Rivers's Eliza. Varieties picked up in old gardens are apt to prove synonymous with others.

As to culture, water and manure are the most important items. When *La Constante* was introduced the speaker planted a bed on hard clayey ground on the slope of a hill, and laid a hose at the top so that they could have all the water they needed, and he never saw such a crop. The fruit was exceedingly large and fine; he picked from two or three rows one hundred baskets, which he sold for one hundred dollars. He approved the suggestions of the essayist in regard to manure. Guano is not safe for strawberries; fifteen or sixteen years ago he had berries of the *Admiral Dundas* eight or nine inches in circumference, and he ordered a man to give the plants a little guano. The following year he applied so much that the leaves grew so high that the fruit could not be seen, and he got no fruit for three years. Wild strawberries are always found to thrive where the wood has been burnt off, showing the benefit of ashes. We should fertilize to make fruit rather than leaves.

Varieties all seem to do best on the soil where they originated. The originators prepare the beds carefully, and get enormous crops; but when the plants are sent out they do not come up to the expectations formed from the extraordinary statements put forth by the

originators, that they have borne such crops as never were seen before. The Manchester, we are told, will bear double the crop of the Hovey, and the James Vick double that of the Manchester. Something must, however, be allowed to the introducers of new kinds, for they would not undertake the work without some enthusiasm to sustain them. If one out of fifty of the new kinds proves valuable, we shall be well paid for testing them. The James Vick is no doubt a very good kind. The Manchester, as shown here, was an entire disappointment. It is, however, not so sour as the Wilson, and is of better color and form, and may become popular. The Shaker Seedling originated near Albany, and a member of the Shaker Society called on the speaker and wished him to introduce it, describing it as of fine color, size, etc., but when a quart of the berries was received, not one was an inch in diameter, and they were pale and soft. It soon passed out of cultivation. The Great American and Jersey Queen have not been shown here to any extent.

Mr. Hovey agreed with the advice given by the essayist to continue to plant seed, in the hope of gaining something superior. When a break once occurs there is no knowing what may be produced. A new variety, to be worthy of introduction, should be hardy, vigorous, and productive, with fruit of good color and fine quality, and it is difficult to get all these points in one variety. A strawberry may be of fair size, but the leaves may burn, or the hulls may be very large, or may turn over so as to be difficult to take hold of. The late J. O. Wellington, of Belmont, said that a woman would pick a hundred quarts of Hovey's Seedlings a day. All points must be looked at. Well selected seed, from the best varieties, especially from pistillate kinds, will produce seedlings as good as the average of the new kinds introduced as remarkable strawberries. Actual impregnation by hand is, however, the only sure way to obtain the best results.

E. W. Wood said that the opening paragraph of Mr. Wilder's essay gave the cause of the difference of opinion which exists in regard to the varieties of strawberries. If we look at the names of the kinds for which this Society offers prizes, and then at those cultivated in the West, we shall find in the latter hardly a name that we recognize, but coming farther east we begin to find a few of those cultivated here. The Wilson, however, adapts itself to all soils, and succeeds on dry land, but has failed for the last few

years. Mr. Wilder does not believe in the degeneracy of varieties, but the speaker had found the Cutter's Seedling for the last four or five years very different from what it was twenty years ago. Then it was one of the best for table use; he never saw a variety which excelled it in flavor. Mr. Wilder and Mr. Hovey had spoken of the Charles Downing as the successor of the Wilson, and it may do for a near market. Last year it was exempt from blight, but it blighted the year before.

Mr. Wilder said that it had never blighted with him.

Mr. Wood said that it had blighted so much as to deter growers from planting it for market. Last year he grew three varieties, the Charles Downing, Sharpless, and Seth Boyden, under the same conditions, and the Sharpless, marketed on the same day with the Charles Downing, averaged almost twice as much in price. The market does not encourage growers to select varieties of the best quality; buyers do not discriminate as to quality. In point of quality the Hervey Davis is worth twice as much as the Sharpless, but the latter will outsell the former in the market every time. Buyers in the market select from appearance only. The strong points of the Wilson are that it is bright colored when other kinds are green, and its good looks and long keeping.

A universal rule in selecting ground for strawberries is to choose ground that will produce a good crop of grass. On his own ground, which is a strong, heavy clay loam, the speaker would like a shower every day. For exhibition fruit, he would set strong runners in August, and keep them as single plants, so that the vigor should be all centred in one plant. For market, he would set them in spring, and let them cover the ground. The Sharpless should be set in rows not less than four feet apart, and eighteen inches in the rows, and will then cover the ground. Strength is gained by taking off the runners, especially the late ones, which exhaust the plant to no profit. This will make strong fruiting plants.

George Hill spoke of the importance of wintering strawberry plants well. They are not generally covered early enough, and are frequently injured by the first cold weather, when the ground freezes two or three inches deep, which does more harm than severer cold later in the season. Mr. Hill exhibited a quantity of plants, most of which were in excellent condition, but some had been injured by the cold, and could not produce the fruit that others would. Strawberries do not often fail for want of manure,

but are more often injured by the winter. The place to look for signs of injury is in the crown. If they have wintered well, he thins out every other one. He covers some as early as the first of November, and those covered at that time have gone through safely, when those covered later failed. He uses old meadow hay, covering thinly; he wants to see the plants through the covering. He agreed with what had been said about irrigating, but there is such a thing as watering too much, which injures the roots. They must have air, which they cannot have if the ground is filled with water. It is death to celery to stand under water twenty-four hours in hot weather; the best way is to saturate the ground, and then let it go for several days or weeks. Mr. Hill agreed with Mr. Wilder that it is important not to disturb the roots of strawberry plants.

William H. Hills, of Plaistow, N. H., said that he had been to the expense of getting the new kinds, and with the Manchester came a chromolith of a plant, showing a most extraordinary crop; but he thought he could beat it with a section of a row of his Miner's Great Prolific, which, on the sunny side, looked almost like a winrow of fruit. The berries ripened on one side before the other, and he found it difficult to get pickers who would pick only ripe fruit. He had found very little difference in the season of ripening of strawberries; the early, middle, and late all come together, and he wants a late variety. The Crescent opens the season, and is the last after the market is over. This variety has been underrated. It is not soft, and remains hard a good while on the vines, and the quality is fair when perfectly ripe. The Cumberland Triumph failed entirely with the speaker last year, giving only a crop of buttons; the circumference was large, but the end was not developed; he did not know whether it was a peculiarity of the variety, or whether the pollen had been washed away. The Glendale was recommended as one of the latest, but he was not pleased with it; it is of a dingy color—light scarlet,—has a very large hull, and is no later than others. The Crystal City has been recommended as the earliest, but a hundred plants did not give him a handful of berries. If this is the rule, it should be stricken from the list. The Windsor Chief was very fine with him last year. He plants in field culture, three feet by one, which is too near for matted rows. It is difficult to keep matted rows down to one foot. In regard to the age of beds, he did not advise replant-

ing as often as is generally done ; he has beds where there was a good crop last year, and he expects to get two or three times as much this year.

Mr. Wilder thought the Crystal City valuable only as being very early. The Cumberland Triumph is magnificent in form and color. Mr. Hills's is the first unfavorable experience that he had heard of. The speaker has thrown aside the Glendale.

Mr. Hovey thought the Cumberland Triumph is pistillate, and that Mr. Hills did not have anything to fertilize it.

Mr. Hills said that it is not pistillate ; and that there were perfect flowering varieties on each side of it. He thought the imperfection caused more by the weather when the plant was in flower.

Mr. Hovey said that the strawberry season with him lasts from the 7th of June to the 15th of July. He had shown Hovey's Seedling five successive weeks. The Jenny Lind is at least ten days earlier than any other.

Samuel H. Pierce thought the selection of ground for strawberries very important. Every one can pick out a place where they will do better than anywhere else on his farm. He has an acre and a half, from which he got a crop of eleven thousand baskets. The next year he planted it with cauliflowers, and the next with Sharpless strawberries, and got another good crop. He did not think that the Sharpless, or any other variety, will bring enough more in the market to pay for extra cultivation. His Sharpless brought but little more than the Charles Downing. The Wilson is gone by ; he procured extra fine plants from New Jersey, and they did well one year, but the next year they did not do well.

Mr. Wilder said that he had never recommended the Wilson. He spoke of degeneracy generally, and not with reference to any particular variety.

John B. Moore spoke of the manurial question, and said that he was glad to see that persons did not assent to the idea that the crop is in proportion to the quantity of manure used. If a plant has food enough, it is a question whether more is not hurtful. He knew of crops in Dighton that have been injured by too much manure. He does not approve the exclusive use of highly nitrogenous manure, such as guano or stable manure. A large portion of the Dighton growers use guano as a top-dressing in spring for such varieties as the Wilson, which do not make foliage enough to cover the fruit. Guano produces abundant foliage, and for that

reason it will not do to apply it to the Sharpless. There is no better fertilizer for strawberries than bone and ashes, but he likes to put ten cords of stable manure to the acre along with it.

The first improvement in the strawberry was at Montreuil, in France, where remarkably fine wild strawberries were produced in a charcoal burners' village. No further improvement came for many years, when the Chili strawberry was introduced, and formed natural crosses, improving the size. In England they were improved by artificial crossing.

The seedlings which the speaker raised from the Early Virginia all came the same as the parent, and seedlings from Rivers's Eliza, with many other kinds growing around it, were the same, both in foliage and fruit, as the parent. After finding these results, it came into his mind to plant a pistillate variety where it could be fertilized by only one kind, and then he got as many varieties as seedlings. He did not agree with Mr. Hovey that this method is not as good as hand fertilization.

The length of time that a bed should be kept must be judged of by the owner. If it is vigorous in the fall, why not keep it? It cannot be replaced by any crop that will pay as much. The Wilson is one of the quickest to fail, but no rule can be laid down. A few years ago he had some strawberries in hills in bearing for five years. He agreed with Mr. Hill that plants are often injured in the fall by a sudden freeze before they are covered. The same variety will not succeed everywhere, and therefore it is impossible to name any one as the best for all cultivators. The Charles Downing is soft, and has behaved so badly for the last three or four years that the Concord and Dighton growers have thrown it aside. At Concord, the Sharpless and Miner's Prolific are the favorites; the latter is very much like the Charles Downing, but larger. The Cumberland Triumph is one of the best market berries, but is a little soft and light colored. He grows the Hervey Davis. He undertook to grow for quality, but the market does not appreciate it; all that buyers care for is a big, firm fruit; those who look for fine quality are so few in number, that it is hardly worth while to cater for them. When the Wilson was introduced he would not plant it at first, but he had to come to it. Though the fruit is so poor, there is a new crop of fools every year to buy them.

C. M. Atkinson said that ninety-nine out of a hundred cultiva-

tors of strawberries think it is impossible to give them too much manure, but he agreed with Mr. Moore that it is not. In England he had a position in a garden seventy years old, where there was an unlimited supply of manure, but the strawberries utterly failed, though the cauliflowers, lettuce, and cabbages were admirable. The strawberry beds were restored by dressing with stiff clay thrown out in laying a pipe, after it had laid all winter, and produced a crop of fruit so fine that he took specimens to the exhibition of the London Horticultural Society. All strawberries will run out unless bearing plants are selected, and the "blind" ones rejected. The uniform crops of English growers are made from forced plants. Hovey's Seedling is particularly liable to come "blind," and when you see a plant with a good crop of fruit, you should put a stick down by it and propagate from it.

O. B. Hadwen was called on, and said that when people enter into the cultivation of fruit in early life, the taste seems to continue, and they grow in enthusiasm. He had cultivated strawberries for nearly fifty years, including the old Alpine, the Early Virginia, and the Jenny Lind. He cultivated the Hovey's Seedling in 1840 and 1882.

The subject for the next Saturday was announced as "Hybrid Perpetual Roses," to be opened by John B. Moore.

BUSINESS MEETING.

SATURDAY, March 10, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The President stated that he had received a cable message from the Imperial Russian Horticultural Society, announcing that the International Exposition of Horticulture and Congress of Botanists and Horticulturists, fixed for May next, in celebration of the twenty-fifth anniversary of that society, had been postponed until next year.

Hon. Marshall P. Wilder, Chairman of the Committee appointed at the meeting on the 24th of February, to prepare resolutions in

memory of Hon. Paul A. Chadbourne, D.D., L.L.D., reported the following:—

Resolved, That the Massachusetts Horticultural Society sympathizes most deeply with the Massachusetts Agricultural College, our Commonwealth, and our country, in the loss sustained by the death of the Hon. Paul A. Chadbourne, D.D., L.L.D., the President of said college; that we sincerely mourn the sudden removal of one so highly distinguished for his learning, scientific attainments, and incessant labors to promote the intellectual and moral improvement of his fellow men, and especially to advance those great rural interests on which, more than on any others, the prosperity and happiness of the world depend.

Resolved, That we gratefully recognize in Dr. Chadbourne a man of the highest moral principles and noblest aspirations,—who always stood forth manfully for the right, whose soul was ever alive to the best interests of mankind, and whose name will be remembered in the annals of our country, as a benefactor to the human race.

Resolved, That these proceedings be entered upon the records of this Society, and that a copy of the same be transmitted to the family of the deceased, with the assurance of the sympathy of the Society with them in their bereavement.

MARSHALL P. WILDER, }
 JOHN B. MOORE, } *Committee.*
 WILLIAM C. STRONG, }

Mr. Wilder said that the death of President Chadbourne, at a time when he had raised the college to an elevation which it had never attained before,—when he had laid his plans for still further improvement in the future, and when the trustees were confiding in his energy and ability, was a most mysterious dispensation of Providence. At the last meeting of the trustees there was a foreshadowing in the mind of the speaker of what has taken place. President Chadbourne stated that he had been doing the work of two professors, each more than that of any one in Williams College, and that he could not do it any longer. Mr. Wilder then moved that the thanks of the Board be tendered to President Chadbourne, for his zeal and energy, which was accordingly done, and he now regarded it as providential that he made this motion.

John B. Moore desired to say that he agreed fully with the

resolutions; President Chadbourne was an able educator, and took great interest in horticulture and agriculture, though engaged in other branches of education. His friends hoped and trusted that he would elevate the college to the highest possible usefulness.

Benjamin P. Ware had had the honor of being associated with President Chadbourne, and wished to say a few words in regard to the great work already accomplished by him. The whole system of instruction at the college had been reorganized, and all the improvements suggested by thirty years' experience in education had been substantially adopted. Though when elected, he was much occupied with other pursuits, he promised to see that the interests of the college should not suffer. He found it not fully provided with professors, and had been doing the work of two, besides preaching on Sundays. The college had been brought by him into a complete and harmonious working condition. It seemed in conversation with him that he had premonitions of his departure, for he had asked, "What will become of that college in case I am taken sick?" Though it now seemed impossible to fill his place, yet the speaker believed that inasmuch as the Great Ruler of the world had seen fit to take him away, He would provide a man to succeed him.

President Hayes said that President Chadbourne was born in the little town of Berwick, Maine, which was also his own native place. The Chadbourne estate was deeded to his ancestors by the Indians, and most of it remained in the family until the middle of the present century. The birthplace of the speaker was on what was formerly the Chadbourne estate. The Chadbourne family came over as the representatives of the Lords Proprietors of the colony, and it is an interesting fact that they caused a vineyard to be planted there two hundred years ago, and made frequent inquiries how it flourished. The locality is still known as "The Vineyard." President Chadbourne's father was in moderate circumstances, and not able to give his son an education, but, through his own energy, he went to Exeter Academy, and afterwards to college. He made himself what he was, and graduated at the head of his class, a grand exemplification of what can be done by poor boys; and he has left the memory of his work at Amherst as a monument of what one of them has done.

The resolutions were unanimously adopted by a rising vote.

Benjamin G. Smith announced the decease of Arthur Bryant, Senior, of Princeton, Illinois, a Corresponding Member of the Society, and moved the appointment of a committee to prepare memorial resolutions. The motion was carried, and the Chair appointed as that committee, Hon. Marshall P. Wilder, Benjamin G. Smith, and Charles M. Hovey.

Adjourned to Saturday, March 17.

MEETING FOR DISCUSSION.

HYBRID PERPETUAL ROSES.

By JOHN B. MOORE, Concord.

Mr. President, Ladies and Gentlemen:

In discussing the subject of Hybrid Perpetual Roses, I may say that they are one of the classes of flowers that I have cultivated with a great deal of interest, and from their beauty and fragrance I have received more real pleasure and enjoyment than from any other flowers that I have grown. I feel my want of power to describe the wonderful beauty of form and color combined in the perfect rose, which with its delightful fragrance renders it the acknowledged Queen of Flowers.

If I had the powers of description of some of our Ex-Presidents, I might in my love for this flower soar almost into the ethereal regions, but for want of this you will have to put up with plain matter of fact descriptions of varieties and methods of culture. And here let me say that the object of this discussion today is to communicate to each other our ideas of the value of the different varieties of Hybrid Perpetual Roses, and how to cultivate them in the best manner; to compare our own with other methods, and adopt the best. If any of us have made mistakes (and who has not), if they are described it will enable others to avoid doing the same thing. And if any person has a method considered superior to others we may give it a trial.

Impressed with these views, and with my duties to my fellow-members, from whom I have received so much instruction, I find that I still have some diffidence about submitting my methods and conclusions, well knowing that among our members will be found the most eminent horticultural talent in New England. And if

any of my views are incorrect it is a duty you owe to this Society, and I shall also consider it a favor to myself, that you should correct them.

The land upon which most of my roses have been planted has a slight inclination to the south; the soil is a sandy loam with a loose sandy subsoil, and most of it is quite dry. It is a soil that would be considered unsuitable for rose culture, but it was such a location and soil as I had near my house, and conveniently situated for the purpose intended, but not such a soil as I should have selected could I have done any better. The fault was largely in the texture of the soil, which was sandy and very loose, and therefore subject to drying up quickly. It had, however, one good point, and that was excellent natural drainage—only too good, for the water passed through soon after falling upon the soil. The remedy applied was a dressing of a material often found in sand-banks and improperly called marl, but really a dried or consolidated quicksand. It looks like and is as hard to excavate as clay, but, unlike clay, when dried it readily falls to pieces, and the particles are finer than common flour. About one inch in thickness was spread upon the rose border when dry, and, reduced to this impalpable powder, was worked into the soil with a harrow and cultivator, and every rain carried these minute particles into and intermixed them with the soil, which by this application was changed from a porous and leachy to a retentive soil, fairly suitable for the purpose intended, and the cost was only the carting and mixing with the soil. I have spoken more particularly of this method of correcting a sandy soil, as it may be useful to others whose situation is the same, not only for roses but also for the general improvement of the soil, for wherever there is a dry, loose, sandy soil, there is almost always this same material in the vicinity.

There was then applied a dressing of stable manure, which was intended to be at the rate of ten cords to the acre; this was ploughed in very deep and the land was afterwards levelled with a harrow, which completed the preparation of the land. It was then planted with rose plants in straight rows four feet apart, and the plants three feet apart in the rows. The plants were one year old, mostly worked on the Manetti and brier stocks. Part of the piece was planted in the autumn and the rest in the spring, and I could not perceive but that both succeeded equally well.

The after cultivation has been simply keeping the lot clean and free from weeds, and in the fall banking up the plants about one foot high with earth taken from spaces between the rows. When the earth is removed from around the plants in the spring, they are pruned; the weak, poor wood being cut out, and the slow growing varieties cut back to six or eight inches, while the stronger growers should be left ten or twelve inches in length. The roses that I have shown in these rooms have been grown in precisely the way I have described, and with the addition of water when needed. And in watering roses, strawberries, or in fact any crop, there does not appear to be any better way than to imitate nature — that is, to wet the land thoroughly, as it would be with a shower, and then stop until it is needed again.

Like other novices I planted a great many kinds. My information about varieties was what I had been able to obtain from the descriptions that I found in the nurserymen's catalogues, and from the few books on the rose. From this source I found out all about the good qualities of any particular rose, and none of its bad ones; the latter information I am constantly acquiring, and while it is annoying and costly, it may perhaps be useful to me in future plantings.

The insects preying upon the rose or its foliage must be *exterminated*. I am using the mildest term in this respect compatible with growing good roses. What are they? First, the rose-bug, whose habits I described two weeks ago. There does not appear to be any feasible way of getting rid of them except by hand picking.

I have received a postal card from C. B. Lovewell, of Wellesley, in regard to the rose-bug, in which he says, "I have destroyed them by the use of whale oil soap of the usual strength, two pounds to fifteen gallons of water. It was used by A. D. Webber as long ago as 1849 on peach trees, and three applications were sufficient to clear them all out. I have used it on grape vines with complete success for years." This, however, would spoil all the roses, even if it destroyed the rose-bugs, and I do not feel certain that it would do that.

The rose slug is another depredator which destroys the foliage and ruins everything when found in large numbers. They are easily kept under by dusting the plants with powdered hellebore in May and early June, two or three applications being sufficient.

There are also two or more varieties of beetles, about the size of a curculio, with long snouts, that eat into and ruin the buds, and a few green worms: these are always to be crushed when found. The rose hopper has not done any material injury to my roses.

It has occurred to me that the judging of roses for prizes by points would probably determine the fact as to which are the best roses for planting, all things considered. Now, so far as general cultivation is concerned, the thousands who are looking to this Society for information as to what varieties of roses they had better plant in their gardens, so that they and their families can enjoy the beauty and fragrance of this flower, and with a reasonable prospect of its production, I think that they as well as ourselves would arrive at correct conclusions, as to the value of the different varieties better, by having them judged by points, and those points entered on the prize card, so that all who read may learn.

The list of varieties of the rose submitted to this Society two years ago by a committee appointed for that purpose, and of which I was a member, has, in my judgment, some great defects. It was necessarily a compromise list. This committee being composed of gentlemen living in different localities, and growing roses on very dissimilar soils, and some of them not very familiar with the more recent varieties, there should be no wonder at their arriving at somewhat different conclusions. Further causes of imperfection were that some varieties succeed only on particular soils and locations, while others grow well almost anywhere, and still others had not been well tested.

Now there are certain indispensable requisites to make a good Hybrid Perpetual Rose for ordinary or general cultivation in the garden, viz., hardiness, vigor of growth, beauty, both in form and color, fragrance, and constancy of bloom. It is hard to find all these good qualities in any one variety of the rose, but the nearer any variety comes to possessing these requirements, the better the general cultivator will be satisfied with the results from growing it, and if we can designate such varieties, the better we shall have done our duty to the public.

Let us all remember, Mr. President, that this Society is leading the public taste in regard to flowers, as well as to fruits and vegetables, and that it is an educational institution in all matters pertaining to horticulture. Let us remember that we are here today for the purpose of acquiring knowledge not only for our own

practice, but also that we may be able, as we are willing, to impart that knowledge so useful to us, to others by our published Transactions.

DISCUSSION.

Mr. Moore added that, while he had described his own method of culture, he did not claim any superior merit for it, for he had found that a flower can be well grown in two ways. It is absolutely necessary not to prune strong growing kinds too short. What are called Hybrid Perpetual Roses are made up in various ways; some of them are crosses of the China with the Damask rose, and might more properly be called Hybrid Chinese. Such are the greater part of the so-called Hybrid Perpetuals. They bloom but once in the season. Some Hybrid Perpetual roses are beautiful, but wanting in fragrance; others lose color in a shower or turn purple, while others look bright. The very full double kinds do not open well; the long, pointed buds with large petals open best. Some have weak stems; others are weak growers. Louis Van Houtte is, perhaps, the most perfect dark rose, but it is a poor grower, and has a tendency to bloom itself to death; but this latter defect is within the control of the grower. Marie Baumann and Alfred Colomb are two of the best roses; the former is best early in the season, and with care can be grown satisfactorily. Both are fragrant and, in good cultivation, bloom more than once in the season, and the blooms are always good. Some varieties are troubled by mildew, which spreads and affects others.

Mr. Moore next went over and criticised the list of forty-eight Hybrid Perpetual roses, recommended by a Committee of the Society two years ago. The classification by colors is often wrong; pink and rose are often confounded. Baroness Rothschild is of fine color, though pink rather than blush, and beautiful to look at, both in flower and foliage, but it has no fragrance, and is not particularly satisfactory out-doors. La France is a Hybrid Tea, a poor grower, and does not open well. It is about as tender as a Tea rose, and is not valuable for forcing to sell. John Hopper is classed as pink, but is more exactly rose and carmine. It seldom blooms more than once, and has little or no odor. François Michelon is not pink, but rose; it has thin petals and a poor stem. Marguerite de St. Amand is bright rose; it does not open very well. Marquise de Castellane is rose color; it blooms more

than once, but is somewhat tender and has no fragrance. The next two, Mme. Georges Schwartz and Mme. Nachury, Mr. Moore said he would not plant. The Comtesse Chabillant is of good form and size, but not particularly desirable. The next two, Marie Finger and Mlle. Eugénie Verdier, classed as rose-salmon, are tender and poor growers out-doors, though the color is very pretty. Victor Verdier is not very hardy, and has no fragrance; there are others that are superior. Mme. G. Luizet is not rose color but light pink, and the best of the color. A specimen was shown by the speaker, from a graft inserted since the first of December. The color is solid and clear. Magna Charta is fragrant, but blooms only once.

Hon. Marshall P. Wilder said that Magna Charta blooms in the fall with him.

Mr. Moore said that the Marchioness of Exeter is fragrant, but hardly as good as Magna Charta. Édouard Morren is not worth growing out-doors. Dupuy Jamain is not rose color, but cherry red; it is a fine grower, but the flowers are only semi-double, and fade. Mme. Thérèse Levet is a free blooming kind. Étienne Levet is a fine rose, of beautiful form, but not fragrant. Alfred Colomb is carmine crimson, fragrant, and one of the very best red roses. It would probably score more points than any other except Mme. G. Luizet. Charles Lefebvre has no fragrance, and is ruined by rain and warm sun. Marie Baumann is crimson vermilion; fragrant, and early in the season better than Alfred Colomb, but later not so good. If the speaker were to select half a dozen roses, this would be one of them. Mme. Victor Verdier is darker — carmine crimson, — fragrant, a good grower, and a very fine rose. Horace Vernet is crimson and scarlet, of fine form, but a little weak in growth. Dr. Andry is of no account. Exposition de Brie is identical with Maurice Bernardin and Ferdinand de Lesseps. It cannot be spared even from a small collection. Mons. E. Y. Teas is carmine crimson, fragrant, rather dwarf, but very fine. Countess of Oxford fades quickly, and mildews extremely easily. Mrs. Laxton is of fine form and color, and fragrant, but a poor grower. Duchesse de Caylus is large and double, but no better than some others. Sir Garnet Wolseley is fragrant and sometimes fine, but mildews. Sénateur Vaïsse can hardly be distinguished from Mons. E. Y. Teas, but the latter is better. The Duke of Edinburgh has no fragrance, and blooms but once.

President Thiers is of a peculiar color; a little wet turns it purple. It blooms pretty constantly. Richard Wallace is not wanted in twenty-five varieties. Thomas Mills is rosy crimson, a strong grower, blooms two or three times a year, and is a fine garden rose. Louis Van Houtte is fine in form and color, and fragrant, but a poor grower; it wants a warm location. Mons. Boncenne is of maroon color, hardy and good, but blooms only once. Abel Carrière is velvety crimson and very fine, but blooms only once. Xavier Olibo is deep crimson and a fine rose, but a poor grower. La Rosière is deep velvety crimson, like Prince Camille de Rohan, but better; it is fragrant. Pierre Notting is deep crimson and violet, fragrant, and one of the grandest roses, but does not open freely. Fisher Holmes is an improved Gen. Jacqueminot, for outdoor culture; it is of the same color, and a free bloomer and fragrant.

Mr. Moore presented the following list as his choice for twenty-four kinds:

| | |
|-----------------------------|----------------------|
| Mabel Morrison, | Étienne Levet, |
| Julius Finger (Hybrid Tea), | Alfred Colomb, |
| Baroness Rothschild, | Charles Lefebvre, |
| John Hopper, | Marie Baumann, |
| François Michelon, | Mme. Victor Verdier, |
| Marquise de Castellane, | Maurice Bernardin, |
| Mme. Gabriel Luizet, | Mons. E. Y. Teas, |
| Magna Charta, | Thomas Mills, |
| Louis Van Houtte, | Pierre Notting, |
| Abel Carrière, | Fisher Holmes, |
| Xavier Olibo, | Baron de Bonstettin, |
| La Rosière, | Rev. J. B. M. Camm. |

Baron de Bonstettin resembles Mons. Boncenne, but is better. Rev. J. B. M. Camm is one of the finest; the color stands well. Jules Margottin has many good points; it is a constant bloomer, and good to have in the garden. Duke of Teck is bright crimson, a good grower, and far superior to most of the new varieties; among the many new ones which Mr. Moore has imported, not one out of ten would be equal to it. Mrs. Harry Turner is claimed in England to be the best rose; it is a good grower, with handsome scarlet crimson flowers. Good roses cannot be had for nothing; every one who wants them must pay for them, and the price is

eternal vigilance. A man who does not love roses will not grow them well, and had better not undertake it.

Mr. Moore said that, although his list was carefully selected, he might want to change it in two years. It is very likely that some of those on it will not grow as well as some of those which he has rejected. In selecting roses, permanency of color is a most important point.

William C. Strong, was called on by the President, and spoke of the importance of fertilization. The essayist had said nothing of continuous fertilization. We all know that feeding is the first step to success, and the process is almost limitless. He had made a bed for roses in the house, of one-third stable manure, and two-thirds loam. Although the impression of many growers would be that such a bed would be unsatisfactory, the manure warmed up the soil, and the growth of the plants was prodigious and uniformly good, and is so to this day, and there is now a very heavy crop of roses on the bed. With that experience, he dressed a bed in autumn with stable manure, and almost ruined it, and a year ago, he watered a bed with a solution of horse manure before it had started, and greatly injured it. The time when roses are fed is very important. Liquid manure may be applied somewhat freely while they are in growth, — not very strong, but constantly, — and produce wonderful results. Roses want daily food; cow manure may be applied more freely than horse manure. Roses are enormous feeders; he had seen the roots run into green cow manure without injury. It is more difficult to apply cow manure in a liquid form than horse manure; it is thick and cannot be drawn through pipes and hose. He had tried artificial manures, but was afraid to use them freely. He had found the thrips, fretter, or hopper, a more serious trouble than Mr. Moore thought it. He doubted the efficacy of hellebore, but had not tried it fully. There is no objection to the employment of whale oil soap before the roses bloom. He wished to emphasize the effects of green horse manure; it will injure roses if it leaches on to their roots to any extent while they are in a dormant state.

Mr. Moore said it is true that you must constantly furnish roses with food to make new wood. After heaping up the earth around his rose bushes in autumn, he gives a dressing of stable manure, but not until the ground is frozen, and it keeps the ground from thawing and freezing. When the earth is removed from the bushes

in the spring, he gives potash and bone, and if liquid manure is needed, he gives it weak, but early and often.

Mr. Wilder felt obliged to Mr. Moore for his careful examination of the lists of roses. It is an established principle that plants should not be fed while in a dormant state, and especially that liquid manure should not be applied. Liquid manure should be very weak; Mr. Mechi's rule was that it should only color the water. Mr. Wilder uses cow manure because it is so mild; he puts it into a gunny-bag, and this into a great cistern, and never gives it without dilution. It has a most sensible effect on all his plants, but he never gives it to them until they are ready to take up food.

Mr. Moore said that his method of making liquid manure is to get a large tub and place two strips of board across it, and on these to put a flour barrel filled with manure, and having holes bored in it. Water is then poured into the barrel and leaches into the tub; when the strength of the manure is exhausted, the barrel is emptied and filled with fresh. The liquid manure must be diluted for use.

Col. Henry W. Wilson thought that some method of sub-irrigation would be devised for applying liquid manure. The principle has been practically wrought out in California already.

E. W. Wood said that Mr. Moore had made roses a special study, and his directions for their culture were given fairly, plainly, and honestly. The speaker had most of the kinds on the list recommended, but had never seen any really good white roses. He thought that if five out of a hundred rose bushes were white, nine-tenths of all the rose-bugs would be found on the five white ones. La France, which is so tender here, in France is marked highest, showing that we must make great allowances in reading European books on the rose. He would grow Baroness Rothschild for the sake of a single flower, and the foliage is very beautiful. He plants his roses in rows three feet apart, and two feet apart in the rows, and banks up high in autumn.

Mr. Moore said that he put his rows four feet apart in order to work between them with a horse.

Mr. Wood said that he had found no difficulty in the less space. After banking up he fills in between with manure, and when he hauls away the earth in the spring, he mixes the manure with it. Louis Van Houtte, when in perfection, is the best rose grown;

Mr. Ellwanger scales it at eighty points in all respects but vigor, which he rates at zero. The speaker has a plant which has bloomed well for six years with no extra care. He would place Alfred Colomb at the head of the list. The greatest improvement of the rose is in endowing it with continuous bloom. Many persons object to planting roses, that they bloom only two or three weeks, but with proper selection of varieties they may be an ornament every day. Mme. Alfred Rougemont blooms all the time, and for bouquets and vases is one of the best. Mr. Hovey thinks it is a little tender, but the speaker had not found it so.

Joseph Clark recommended the Baroness Prevost as being, though an old rose, a very fine bloomer through the summer.

Mr. Strong asked whether any one had had any experience with the *Triomphe d'Angers*. It is not an exhibition rose, and changes color, which makes it objectionable to florists; but there is no rose that he had found so free flowering, and he thought it would be satisfactory to the public. He intended to cultivate it so as to bring it in as a substitute for the *Gen. Jacqueminot* at Christmas.

C. M. Atkinson thought that giving too much prominence to fragrance in judging roses by points, would have a tendency to throw out really good roses. He would instruct judges not to be too particular in regard to fragrance. The more double a rose is—that is, the more the stamens are turned into petals—the less chance there is that it will be fragrant. He enjoys Tea roses most in their last stages, because they are then most fragrant.

Mr. Moore said there are many roses which have no fragrance, that he would not discard, but he should consider them more valuable if they were fragrant. A rose destitute of fragrance may yet take a prize. The *Cornelia Cook* is a Tea rose without fragrance. He questioned Mr. Atkinson's view that very double roses are not so fragrant as less double varieties. The *Alfred Colomb*, *E. Y. Teas*, *Marie Baumann*, and *Rev. J. B. M. Camm* are all extra double and very fragrant.

Mr. Strong remarked that some Tea roses have a positively disagreeable odor, and that every one might not agree with the judgment of an awarding committee in regard to the fragrance of roses.

Mr. Moore thought that if a rose possessed a disagreeable odor—like that of the skunk cabbage for instance—there would be no difference in regard to condemning it. Every one knows and loves the peculiar odor which we call the fragrance of the rose.

Mr. Wilder exhibited two seedling Chinese Azaleas in flower at two years from seed. Last year he exhibited plants which showed remarkable vigor at a year from seed, and expressed the belief that he should have them in bloom at two years. He was himself astonished at such early flowering, as were M. Van Houtte and other cultivators whom he informed of his success, for it was never supposed to be possible. He has quite a number of these seedlings coming on.

Notice was given that the subject for the next Saturday would be the "Culture of Currants, Raspberries, Gooseberries and Blackberries," to be opened by James Comley.

BUSINESS MEETING.

SATURDAY, March 17, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair. No business being brought before the meeting, it

Adjourned to Saturday, March 24.

MEETING FOR DISCUSSION.

CULTURE OF CURRANTS, GOOSEBERRIES, BLACKBERRIES, AND RASPBERRIES.

It was expected that the discussion would be opened by James Comley, but as he was prevented by illness from attending, the President called on Benjamin G. Smith, who said that he had to contend with a stiff clay soil in his garden, but in one corner he found a deposit of reddish sandy loam, of which he had two hundred cartloads spread on the garden, and the whole underdrained, subsoiled, and enriched with barnyard manure, and he had been fairly successful in cultivating gooseberries and currants. He had cultivated English gooseberries for eight years without mildew. He manures them freely and prunes severely. It is impossible to get good fruit from them without strong, healthy

foliage. The currant worm is the greatest obstacle to success, but he dusts with hellebore two or three times in a season, which keeps them from doing much injury. He prunes the bushes as carefully as he does his grape vines—some on the spur system and some with long shoots, and finds both equally successful. He used to mulch them but lately has not, and they have done equally well. English gooseberries must be shaded from the hot noon suns; his are planted on the north side of a high fence, twelve or fifteen feet from it. Currants also do well in the shade. Though it has been said that they should be renewed every five or six years, he cultivates the same bushes that he did fifteen years ago. With these, and also with his raspberries, he aims to produce the best fruit without regard to quantity.

John B. Moore was next called on, and said that the blackberry is one of the best fruits when well grown and ripened. The great difficulty with it is the winter-killing of the canes. The Dorchester, Lawton, and Wilson are tender, and the Snyder, Kittatinny, and Wachusett are hardier, but the fruit of the last named is small and of inferior quality. In field culture blackberries must be grown on high land, without manure, otherwise the canes will be tender. They are all hardy in the roots. The speaker knows persons in Weston who cultivate the blackberry largely, and lay down the canes and cover them. If they grow too rank in summer the canes must be shortened. He has thrown aside the Wachusett and others, and last year planted the Snyder, and is testing others in regard to profit as well as quality.

He has grown raspberries to a considerable extent; there are some that are called hardy, but he knows none that will not be injured by the winter. There is some question in regard to the best varieties. He has grown the Herstine and it is of good quality, and good for field culture, but he wants something better. The Saunders is a little better for field culture. In a rich soil where they will grow well, raspberries should be planted in rows six feet apart, and from two and a half to three feet apart in the rows. It is a mistake to plant in hills as is commonly done. He sets a braced post two and a half or three feet high at each end of the row, and stretches a galvanized wire, with a stake every thirty or forty feet to support it. The canes are tied to this wire, reasonably tight, with cotton twine. They are spread about six inches apart, and do not smother each other. This method of support-

ing them is cheaper than stakes, and it permits of cultivation by horse power, which should be used as far as possible. Most kinds throw up suckers, which should be chopped off, or there will be too many weak shoots. In the fall the canes should be laid down, which is not so much work as would be supposed. It takes two men to do the work to advantage; one to hold the tops down and the other to throw on the earth until they are fastened down. Begin at one end and throw a shovelful of earth against the first canes, so that they shall not be bent too short; then bend them down and throw a shovelful on the tops, so as to keep them down, and so on; and when all are thus fastened go over and finish covering. The soil should first be stirred with a cultivator. They should be uncovered and lifted up as soon as the ground is thawed, or they will start too soon. Mr. Moore cuts out the old canes as soon as they have fruited, though he could not say that it is any better than leaving them until they are laid down. Currants do better on a stiff than on a sandy soil, and will grow in the shade.

Mr. Smith said it is true that the soil should not be stirred in the spring around gooseberries, unless it is done very early. It may be done in August, but manure should not be applied late in the season. The growth is made early in the season, and it is unwise to start them into late growth. He uses coal ashes on his plums and small fruits, and finds they are more vigorous where it is applied. The best English gooseberries are Woodward's White-smith, Wellington's Glory, Glenton Green, and Yellow Amber; and of native varieties, the Downing and Smith's Seedling.

E. W. Wood said that currants are easily grown, and are reliable, and might be more generally grown with profit than they are. Many of those sold in Boston come from Connecticut. Mr. Smith's views in regard to their cultivation are correct, as is shown by the many prizes which he takes. The main variety for profit or for the table is the Versailles, which invariably takes all the Society's prizes for red currants. It has been complained of as not prolific, and it is true that it will not give good crops year after year, neglected under a stone wall as farmers used to grow currants. Currants will not stand neglect, but Mr. Smith's experience of fifteen or twenty years shows that, with care, they will endure for a long time. He cuts out all the old wood and gets new, and feeds them well. The currant will flourish in partial shade, and is, therefore, well adapted for small gardens. Mr. Smith's success with gooseberries has been remarkable.

Raspberries and blackberries will produce good crops with less manure than currants require. The quantity of raspberries shown at the exhibitions of the Society has lately been curtailed by the loss of plants during winter, but the speaker had heard reports of more profit from their culture than from that of any other small fruit. No variety is perfectly hardy; he cultivated the Clarke for seven or eight years, and lost none except one year. More Franconias are shown at our exhibitions than any other variety, and none is more reliable. For the last three years the Saunders has taken the first prize; it is of better quality than the Herstine, though less attractive. The Saunders is soft, but good for home use. The speaker saw a most beautiful show of Dorchester blackberries on the grounds of J. B. Case, in Weston. They were set in rows eight feet apart, and the plants four feet apart in the row, and tied to wires stretched four or five feet from the ground. A row of posts was set on each side of the row of blackberries and three feet from it, and on these the wires were stretched. They were topped at six feet in height. The soil was strong, and the ground was covered with meadow hay, which was allowed to remain. After the canes had ripened they were bent down and covered with earth and hay. A fair top-dressing was given in the fall, and they had been thus cultivated with uniform success for a series of years. The speaker had never seen such an immense crop. He has a row of the Kittatiny from which he never lost a crop. The quality is very good, and the fruit brings a good price. It is more hardy than the Dorchester, the early canes not being winter-killed. We want something more reliable in blackberries than the Dorchester, and which shall not be too much expense to protect, such as might be produced from a cross of the Dorchester with the Snyder, or something more hardy.

George F. Wheeler said that the Snyder and Wachusett are grown at Concord more largely than other blackberries. We have not yet got a variety that will endure the winter without laying down. It is not of much use to cultivate them if you have not the right soil; a light soil is not good; they want something stronger, either rocky or clayey. Mr. Case's soil is better than a lighter one. Last year there were few blackberries, owing to the winter-killing of the canes, but last summer was dry and the wood ripened, and has probably come through the winter better. He had been most successful with the Clarke raspberry; the Franconia wants a rocky or

clayey soil ; on his ground it was feeble, and he discarded it. The Philadelphia is a great bearer, but the color is poor for market. The Brandywine is of feeble growth, but hardy and bright looking, and though the quality is not approved in exhibitions, it is fine for shipping, and brings good prices. The Cuthbert is a strong grower, but winter-killed last year.

Col. Henry W. Wilson said that we had heard how to make small fruits profitable, and he would say something for those who want fine fruit for their own tables. He trains the Lawton blackberry on a slat fence, preferring the north side, and pinches the shoots so as to cause them to make laterals, and gets a profusion of fruit which is perfectly bewildering. The bunches of ten or twelve berries each were all ripe at once. The blackberry is not a gross feeder, but will grow in any good garden soil. All small fruits want mineral salts—phosphoric acid, potash, and lime—and they must be grown in proper soil, or you will get no satisfactory results. The soil should be trenched, which is not expensive. The thorough preparation of the soil is as profitable on a large as on a small scale. However fine the fruit which we see in woodland clearings, we can produce finer in the garden. Mr. Smith's clay ground is probably the wash of diluvial moraines, and the coal ashes penetrates and lightens the soil. The blackberry wants water when swelling off, and hence the benefit of mulching or turning on a stream of water. Col. Wilson's raspberries are planted on a northern slope—a clayey soil with a sandy subsoil,—and trained up through barrel hoops, and supply two families. The currant will thrive in absolute shade, where no sunlight reaches the soil, but he has given up its cultivation on account of the currant worm. Potash is one of the constituent elements of granite, and having occasion to quarry thirty or forty thousand tons of stone he noticed that the quarrymen carefully saved all the fine dust for use in their gardens. It can be composted with lime, and will furnish potash in just the right quantity for the soil. Feldspar gives twenty-five per cent of caustic potash, and the speaker hoped we should be able to develop several such deposits. All salts for fertilizers should be neutral.

William H. Hills, of Plaistow, N. H., said that he cultivated the fruits under discussion in a small way, growing them for his table and selling the surplus. He examines all the new things he can, and was surprised that the new varieties of these fruits had

not been spoken of. If the stories told in the catalogues are true, they will give us all we want, without the need of either cultivation or manure. He does not tie up his raspberries, except when the snow has broken them down. He clips them with hedge shears when they are about three feet high, and the blackberries when they are a little higher; but this must not be done when you want to multiply tip-rooting raspberries. He goes over the plants at two or three different times, and clips the tender ends as they reach the desired height. If neglected till the more advanced canes become hard, they will not branch and form a bushy top. He cuts back the branches when a foot and a half long. He thought he could not afford stakes. He had found the Turner raspberry entirely hardy, never having a tip injured, and the same is true of the Snyder blackberry, which sets fruit very bountifully, but he feared that it would prove too small. In New Hampshire there are blackberries and raspberries growing wild, and people ridicule the idea of cultivating them, when they can, as some claim, pick fifty bushels of wild ones at their doors; but the cultivated ones are superior, if they are allowed to ripen. The speaker recommended to young men to examine wild varieties and select the finest, and they would often find one of superior quality, which they should transplant and cultivate, or save the seed of. Most of the superior varieties have been produced in this way. The men who recommend the Souhegan (Black Cap) raspberry, are those who have large quantities of plants, bought of the originator. The currant worm strips the bushes of their leaves so suddenly that it must be very carefully watched.

Mr. Hills has a cold grapery containing twenty varieties, where he has no trouble with mildew, sulphur being sure death to it. He had a Hartford Prolific grape vine trained on his house, the fruit of which mildewed, and he heated bricks and placed under the vine and sprinkled with sulphur, and could smell the fumes of sulphur every time he passed by for a week. With sulphur sprinkled on the ground, he got as good results from the heat of the sun. The mildew made no progress after the application. He thought sulphur might be applied to gooseberries to prevent mildew.

Hon. Marshall P. Wilder said that in Mr. Hill's location, the raspberry is covered with snow. By clipping and causing the growth of laterals, he causes the wood to ripen, and makes a com-

paratively hardy plant of a tender one. The speaker had found no raspberry perfectly hardy except the Turner, and here the others must be laid down, as directed by Mr. Moore, which is easily done even when acres are cultivated. He thought Mr. Moore's system of training a good one. The Franconia raspberry is about as good as anything we have ever had. Knevett's Giant is of the finest quality, but more tender and more difficult to grow. Good as the Cuthbert may seem, Brinckle's Orange is more delicious for amateurs, but it is a little tender. If he could have but one raspberry he would have the Souchetti Blanc, which has become a standard variety, on account of its long and abundant bearing. He has the Versaillaise currant planted in the lines of his pear trees, and sells from one hundred to one hundred and fifty dollars' worth every year. It is the most profitable variety, and was introduced by him from Europe, as were also the Hornet, Knevett's, and Souchetti raspberries. Dana's Transparent is the finest white currant, and is worth cultivating for ornament. The Dorchester blackberry was introduced by Eliphalet Thayer, of Dorchester, who first exhibited it before this Society on the 7th of August, 1841, and that afternoon the speaker went with the late Cheever Newhall to see it growing. He has never found it tender, and has never failed of a crop. In his location he has the influence of the sea air, which prevents injury from frost.

The impositions by outrageously exaggerated descriptions of new fruits are a national and a moral evil. If any one of them comes anywhere near the recommendations given, we shall never need anything more. It will not do to encourage them. He is not satisfied without trying all the new things under his own eye, and had just received, in his old age, a case of plants from Belgium. If we get one fruit out of fifty as good as the Franconia raspberry or Versaillaise currant, it will be worth all we have spent.

Dr. H. Holmes said that he had grown the Red Dutch currant and a white variety as old, and also the Belgian or Grand Imperial, the Versaillaise, and the Cherry, and the last is ahead in size, and consequently most acceptable in the family. The Versaillaise is next in size and more prolific, but none excel the Red Dutch in quality. The Belgian is a little later than the others; he has it until the middle of September, and has an ample supply for the robins. It grows up in tree form, and makes the strongest wood of any. He got the plants from Capt. Davis, of Arlington. He

finds three broods of currant worms; the first from the 12th to the 16th of May; the second about the 25th of May, and the last from the 15th to the 20th of June. The eggs are laid on the under side of the leaves, and the insects at first are almost microscopic in size. He applies a strong infusion of hellebore with a syringe, instead of dusting with the powder, and in this way reaches the young worms on the under side of the leaves, and has succeeded in getting good crops. The worms must be carefully watched, as they will sometimes spoil the bushes in forty-eight hours. He cultivates gooseberries, and gets all the fruit he wants, without any trouble from mildew; he has an old English variety which is a prolific bearer, and has given satisfaction. He agreed with all that had been said to the credit of the Franconia raspberry; it has stood the winters with him, while the Clarke stood two winters, and the third nearly every cane was killed. He cultivates the Lawton blackberry, but the canes are too stiff to lay down, and are largely winter-killed.

William C. Strong said that he belonged to the class which publishes catalogues, and in his cultivation of small fruits, he wished to produce plants rather than fruit, and therefore, allowed the suckers of his raspberries and blackberries to grow. The Taylor's Prolific blackberry had proved as hardy as the Snyder, and perhaps larger, and it gave such a profusion of fruit as he had never witnessed. In regard to mildew, prevention is better than cure. The exemption of Mr. Smith's English gooseberries, is largely owing to the position of his plants, where they are partially sheltered from the sun and have the advantage of humidity. For clipping raspberries and blackberries an old scythe blade fastened to a handle is more effectual than shears.

Robert Manning said that he had found the Dorchester blackberry so tender that he always covered it. He had bent down and covered a cane measuring over thirteen feet in length, besides laterals. Knevett's Giant raspberry is one of the finest varieties, and will sometimes stand the winter, but to be sure of a crop they must be covered.

Mr. Moore said that the Franconia raspberry wants high, rocky soils, and that there are better and more productive kinds. It does not stand as well as it did ten years ago, and does not succeed with him. He prefers the Saunders, Herstine, or Northumberland Fillbasket.

Mr. Wilder said that his soil, where the Franconia flourishes, is deep clay.

Mr. Smith said that his soil is clayey like Mr. Wilder's, and he has grown the Franconia there from the same stools for twenty-two years, and it is as good now as ever. It does not make as many suckers as other kinds.

Aaron D. Capen endorsed everything that Mr. Smith had said in favor of the Franconia. He has stools that have stood for twenty years in the same place, and he did not recollect manuring them above three times. Two years ago he had canes ten feet high, and he did not trim them until he laid them down.

Mr. Moore said that he did not object to the Franconia except in certain locations. It will not succeed with half the cultivators. It is troubled with leaf blight.

Mr. Hills asked whether the Taylor blackberry is distinct from the Snyder.

Mr. Strong did not know that he could state the difference in the characteristics of the two varieties, and his Taylors are in an entirely different soil from his Snyders; but the Taylor is amazingly prolific.

Mr. Wilder said that the Taylor is a freer grower than the Snyder, and the fruit is larger.

Mr. Capen recommended the cultivation of the Low Blackberry, or Dewberry; he had seen it very fine in Connecticut.

Mr. Moore said that raspberry or blackberry canes, not topped, throw stronger shoots and give larger fruit.

It was announced that on the next Saturday Edmund Hersey would read a paper on "Preparing and Fertilizing the soil for the Growth of Plants."

BUSINESS MEETING.

SATURDAY, March 24, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HON. FRANCIS B. HAYES, in the chair.

Hon. Marshall P. Wilder, Chairman of the Committee appointed two weeks previously to prepare a memorial of Arthur Bryant, reported as follows:

He had been long acquainted with Mr. Bryant, and felt it a duty to do what he could to perpetuate his memory. Mr. Bryant was an educated man, under the tutorship of his brother, William Cullen Bryant, the poet, with whom for a time he was associated on the New York Evening Post. He was a thorough scholar, eminent for his knowledge of Greek and Botany, and for his love of the beautiful in nature. He was especially interested in the conservation of our forests and in the planting of new ones. He was the author of a book on "Forest Trees for Shelter, Ornament, and Profit;" was a pioneer nurseryman in the west, President of the Illinois State Horticultural Society, and Vice-President of the American Pomological Society for that State. His decease has been widely noticed by the press, and as a son of Massachusetts, and a Corresponding Member of this Society, it is fitting that we, too, should preserve in our records a remembrance of his services and worth. Therefore be it

Resolved, That in the death of Arthur Bryant, Senior, a Corresponding Member of this Society, we have, in common with the whole country, to deplore the loss of one of our most distinguished pioneers of horticultural science, rural adornment, and the preservation of our forests.

Resolved, That in the character of Mr. Bryant we recognize an instinctive love of home, country, and the progress of rural adornment, and the virtues of an enterprising, upright, and Christian gentleman.

Resolved, That a copy of these resolutions be forwarded to the family of the deceased.

MARSHALL P. WILDER, }
BENJAMIN G. SMITH, } *Committee.*

Benjamin G. Smith seconded the resolutions, remarking that he had much pleasure in the acquaintance of Mr. Bryant, who bore a strong resemblance to his brother, the poet. Mr. Smith added that Mr. Bryant was a student at the United States Military Academy at West Point.

Leander Wetherell said that when at an academy at Cumington, Mr. Bryant's native place, he visited his home and had the pleasure of meeting him. He was much impressed with the beautiful scenery of the town, amidst which Mr. Bryant grew up.

The resolutions were unanimously adopted.

Adjourned to Saturday, March 31.

MEETING FOR DISCUSSION.

FERTILIZING AND PREPARING THE SOIL FOR THE GROWTH OF
PLANTS.

By EDMUND HERSEY, Hingham.

The subject assigned to me covers so wide a field for thought, that the time allowed for the opening essay is not sufficient to give even an outline of the principal points. I have therefore confined myself to two points:—First, the power of plants to gather up their special food; and, Second, the condition of soil to grow crops to the best advantage.

Nature, when left to herself, has ways of her own for fertilizing, and preparing the soil for the moderate growth of native plants, but when man demands of her an excessive growth of either native or foreign plants, and removes from the soil both the stalk and the seed, she refuses to comply with his demands unless he makes especial efforts to assist her, by the application of fertilizers and the pulverizing of the soil, to supply the increased demand thus made upon her.

Whenever we make an attempt to produce more than a natural growth of vegetation on any soil, if we would work to the best advantage, we need to know something of plant growth—a subject which we scarcely enter upon before we find ourselves surrounded by the most minute complications, shrouded in mystery, yet always working out the same results.

The rose, the pink, and the strawberry will grow side by side, the roots mingling together in the same soil, and the branches and leaves intertwining in, and surrounded by the same air; yet the rose bush gathers up and manufactures the particular substance necessary to produce the wood, the leaf and the flower of the rose, while the pink, from the same sources, gathers up materials necessary to produce the stalk, the leaf, and the flower of the pink; and the strawberry gathers from the same soil and air the material that forms, not only the stalk, the leaf, and the flower, but also the luscious fruit of the strawberry, and each from the same sources gathers up the delightful odors, so peculiar to the flower of each plant. Compare the fruit of the strawberry, with that of the rose, or with the seed of the pink, and how unlike they are, yet the roots and leaves feed upon the same materials.

The question arises, "Do the leaves and roots of plants have the power of selection, and of taking in precisely what is required to produce all of the peculiarities of each plant? Evidently, they do not, except to a limited degree. If they did, would they not refuse to take up poisonous substances, which they sometimes do in such quantities as to destroy the life of the plant? Must we not come to the conclusion that each plant is provided with a laboratory wherein is manufactured the particular substance required to produce all of the peculiarities of the plant and the fruit; in fact, is there not much evidence to prove that each minute cell, of which plants are composed, is complete in itself, and capable of manufacturing out of the substances drawn up through the roots and absorbed by the leaves, a material which will produce another cell precisely like it, and also a material possessing all the peculiarities of the fruit of the plant, which the stalk and leaf represent? We get some evidence of this if we take a seedling apple tree, with two branches, grafting one with a scion of the Sweet Bough, and the other with a scion of the Baldwin apple. As the material for each branch of the tree is drawn up by the same roots, there can be no doubt that the material which enters the wood of the scion of the sweet apple, is precisely the same as that which enters the wood of the scion of the sour apple. Yet, when this is acted upon by the air drawn in by the leaves, in the cells of the wood of the sweet apple, the result is the formation of the material necessary to produce the form, color, and flavor, as well as the keeping qualities of the Sweet Bough; while that which enters the cells of the wood of the sour apple, produces that substance necessary to produce the form, color, flavor, and keeping qualities of the Baldwin apple. To discover the difference in the structure of the cells of these two varieties of apples, requires higher perceptive powers than have as yet been given to man. We only know the results; in contemplating them we are lost in wonder, and filled with admiration at the perfectness of structure and the positiveness of action of these minute germs of vegetable life.

The more closely we examine the vegetable world the more perfect we find it, and the higher is our admiration and the stronger our love for that Supreme Intelligence which governs the universe, even to the smallest germs of animal and vegetable life.

I have thus apparently diverged somewhat from my subject, but it has been done to call your attention to the power of plants to

gather up the fertilizers applied to the soil and convert them into substances that represent the peculiarities of each plant. The chemist tells us that the three principal substances which we need to apply to the soil to assist the growth of plants, are Phosphate, Potash, and Nitrogen. Chemistry also teaches us that plants contain large quantities of carbon; but we are taught that carbon in the form of carbonic acid is floating in the air in sufficient quantities to supply the wants of growing plants. This may be true, and probably is where only a natural growth is required; but where an excessive growth is required there appears to be good evidence to prove that a larger quantity is beneficial. The atmosphere contains only about six parts of carbonic acid to each ten thousand parts, while the air in good garden soil contains more than four hundred parts, and a newly manured field during wet weather more than one thousand parts to each ten thousand. As vegetation on well manured land grows very rapidly after a shower, it is evident that the large quantity of carbonic acid which must necessarily be in the soil does no serious injury, but some good. There may be, and probably is, a point beyond which it is not safe to furnish carbonic acid for plant growth, but it evidently is not often reached in the cultivation of plants in the open air. The presence of large quantities of carbonic acid in the soil is believed to be beneficial, not so much by direct action on the growing plants as by its action on the soil, dissolving valuable mineral elements, and rendering them available for plant food.

In fertilizing the soil we should ever keep in view the fact that everything which enters into plants must first be reduced to atoms; and it is also well to keep in mind the fact that nature has wonderful power to assist man in this reduction. If we apply coarse materials to the soil, the heat, the air, and the moisture commence at once the work of decomposition, the rapidity of which depends on the character of the materials applied, and the manner of its application.

As our principal object in the preparation of the soil is to encourage rapid plant growth, we should endeavor to make ourselves familiar with those conditions necessary to accomplish this purpose. It being already understood that all fertilizing materials before becoming plant food must be first reduced to atoms, and be of a character to mingle with both water and air, it is evident that in the application of fertilizers we should make an effort to place

them where they will change into atoms fast enough to supply the wants of the growing plants, and it is also evident that the soil should be changed into that condition best adapted for the rapid decomposition of coarse materials applied. If we apply stable manure it should be placed where it will receive the heat of the sun, the oxygen of the air, and the moisture of the earth; all of which act on the materials of which the manure is composed, separating the mineral from the gaseous portions, and reducing them to minute particles. Good cultivators have learned that rapid growth is best secured by thoroughly mixing the manure with well pulverized soil, keeping it within a few inches of the surface; this is because the light, pulverized soil readily admits the heat, air, and water.

The fact should not be overlooked that for rapid plant growth, the soil should be made light by considerable quantities of partially decayed vegetation. A soil with all of the coarse particles removed, by sifting through a fine sieve, would not be as well adapted to the rapid growth of plants, as a soil lightened up with partially decayed vegetation, for several reasons. First, because, being more compact, the air is in a great measure shut out. Second, the particles of earth being so fine, there is nothing to keep it from becoming soggy with the first rain, and becoming firm and hard as soon as it dries. Third, there being no vegetation to decompose, there can be no rapid manufacture of nitric acid, or nitrous acid and ammonia, and in fact no carbonic acid, all of which are necessary for plant growth, and also necessary to produce a chemical action on the soil. Whenever we apply highly concentrated fertilizers to the soil, we should always do it in connection with coarse manures, or apply it to soils already rich in partially decayed vegetation.

It should always be our aim to keep the soil so light and loose near the surface, that the air and moisture will have a free circulation through several inches in depth, for these are the true elements which join hands as messengers, and unite with the atoms of phosphate, potash, lime, silica, nitrogenous compounds, and other materials, and when united carry them to the roots of the growing plants.

In preparing the soil for growing plants, there is still another point that should not be lost sight of, which is, that if we would secure the most rapid growth, we must not only have the soil so

prepared that the air and moisture will readily circulate through all portions of it to the depth of several inches, but we must also have the soil filled, during the period of plant growth, with all the elements of plant food in that particular form necessary to readily unite with both the air and water; yet if we would use economy in our operations, we must avoid applying more fertilizers in a soluble form than the plants can consume; especially is this true of nitrogenous compounds.

He who applies a hundred cords of manure to the acre, manufactures nitrogenous and carbonaceous substances more rapidly than the most vigorous growing crops can consume them. While possibly the crop might be larger than if only twenty cords had been applied, it would be grown at a much less profit, except under very extraordinary circumstances; for plants, like animals, can consume only a limited amount of food; and plants, like animals, to keep them healthy, must have food containing the different elements in the right proportions. For example, if we should apply large quantities of nitrates to the soil, with no phosphates or alkalies, our plants would refuse to grow with any vigor. So with any other single element.

To work judiciously, we must work intelligently, and apply to each crop the proper proportions of each element; this is a work not easily accomplished; for though the chemist can tell us what each plant is composed of, he cannot so readily tell us from what particular source each element is derived; and as few of the materials applied as fertilizers have passed into the form of available plant food, we are compelled to judge how rapidly they will change, or we cannot tell what quantities it is necessary to apply to furnish each particular element as fast as needed by the crop.

In no department of agriculture is light more needed than in that which relates to the application of manures. It is very easy to make an expensive mistake, by applying more manure than enough to supply all the wants of the growing crop, and by applying it in such condition, or in such manner, that it will not have become plant food until long after wanted by the growing crop. Thus the plants suffer for the want of food while surrounded with more than sufficient, but in a state that cannot be taken up. When coarse manure is covered up eight or ten inches in depth, and permitted to remain undisturbed, it must not be expected that it will be converted into plant food as quickly as if applied within a few inches

of the surface, where it will be disturbed every time the crop is cultivated. While it is important that a portion of the fertilizers should be applied in a condition and in a manner to furnish plenty of food to the young growing plant, it is also important that a considerable portion should be applied in a condition and in a manner to furnish food to the maturing plant and the ripening seed.

In high culture, care is taken to keep the land filled with fertilizers in different stages of decomposition, that the plants may, in all stages of growth, have plenty of food: but in ordinary field culture, we do not usually do this, therefore we often fail to get a good crop; not because manure enough has not been applied, but because it has not become plant food at just the time needed by the growing crop.

He who would be a successful cultivator should be a close observer of nature, and should strive to become as familiar with the wants of growing plants as he is with the wants of farm animals; for to tend and feed growing crops with the greatest economy, requires quite as much intelligence as to care for, and feed, cattle successfully.

The farmer who should gather up winter fodder for his cattle, and then leave it in the open air to waste its nutritive qualities, would be considered as adopting a very wasteful practice; but the same farmer might compost all of his manure in the open air, and leave it six months without exciting a single remark; yet the manure, in the process of decomposition, will lose a considerable portion of its plant food, and will also have its power to create important chemical changes in the soil greatly reduced. It is believed by some that, when vegetable substances are decomposed in the soil, nitrogen is manufactured, by a process not yet understood, in quantities so large that a portion of it must be drawn from the air.

It is becoming more and more evident that, in field culture, barn manure should be applied in a fresh state, and so mingled with the soil as to encourage rapid decomposition, and thus create a mechanical as well as chemical action on the soil, which is highly beneficial to the growing crop, and which would be lost if decomposition was permitted to take place in the compost heap.

In conclusion, I would call your attention to the fact that the over application and misapplication of phosphate and potash, does not result in that loss which is caused by the over application and

misapplication of materials containing nitrogen and carbon, because, though the soil is filled with molecules composed of mineral substances, water and air, to an extent far beyond the capacity of plants to absorb, when they reach the surface of the soil the water evaporates, and the air mingles with its native element, thus separating from, and leaving in the soil unconsumed, the mineral elements; but when the soil is overcharged with molecules made up of air, water, and nitrous acid in combination with ammonia, or carbonate of ammonia, the moment they come to the air they mingle with it, and are thus lost, so far as relates to any future advantage to the soil.

From this the natural conclusion is, that in fertilizing the soil for growing crops, we may apply with a liberal hand both phosphate and potash without fear of loss, except by leaching; but that when we apply those elements of fertility which change to a gaseous form, it is not, as a rule, economy to apply them in quantities much larger than the growing crops can consume.

DISCUSSION.

John B. Moore said that away from cities it is becoming a serious question how we are to grow crops, and restore and keep up the fertility of soils which have been depleted by over production. The essayist is right in the belief that chemical fertilizers should be applied in connection with coarse manures. Market gardeners can see no benefit from chemical fertilizers; but how should they, when they apply along with them as much stable manure as the crop needs? The speaker had seen very large crops of corn grown year after year, with chemical fertilizers. But the question comes up, how are we to get them? For, at present, it is evident that they cost more than farmers can afford to pay for them, though they are better than formerly. The nitrogen which they contain is from various sources. They are all valuable, but it is useless to apply them to plants which are not in vigorous growth. He had seen a dressing of nitrate of soda applied to grass in autumn, when it was utterly useless. It disappeared either by leaching or evaporation; but, if applied in spring it would have caused a heavy growth. The lysimeter does not show any loss of potash and bone by leaching, but it does show a loss of nitric acid in the winter, but not in the growing season. He

had found by experience that it is unnecessary to pay any attention to providing a supply of nitrogen, but is of the opinion that, with the ordinary methods of manuring, Nature will provide a sufficient quantity. He believes that it is manufactured in the soil by the condensation of the nitrogen of the atmosphere, or enough is supplied by the decomposition of stable manure. Constant cultivation and stirring of the soil causes it to absorb nitrogen from the air. Of two pieces of corn or cabbages, one of which is frequently stirred, and the other is not, the former will be much better than the latter; and this superiority is not due to mechanical action alone. But it is necessary to provide potash and phosphoric acid. No chemist can tell in what form any substance will be fifteen minutes after it is put into the soil.

Col. Henry W. Wilson said that in preparing soil for the growth of plants it is not generally stirred more than from six to ten inches in depth, but he thought the deeper it is stirred, inside of four feet, the better. A box of earth four feet in depth, will hold all the moisture necessary to support vegetation. No plant can be induced to send its roots below the water table—that is, the level at which water stands in the soil. If this is too high, it must be lowered by draining. He could judge by the character of the grasses on a given soil whether it needed draining. Thorough pulverization in connection with perfect drainage, is the most important operation on the soil. Air is the great disintegrator, and oxygen is its great agent in that work. No form of nitrogen is plant food, but only a solvent. The atmosphere is the great source of nitrogen; all the upper parts are filled with nitrogen clouds, which are absorbed and brought down by the rain. Carbon in the soil is one of the constituents of butter and sugar, and by roasting the soil, the carbon is supplied in a form to be taken up. The essayist spoke of plants absorbing atoms; but no particle of undissolved matter can enter a plant; their capillary organs are so minute that food can enter only in solution. They cannot assimilate particles. Potash is not easily evaporated, and so its virtue remains in the soil for the ensuing year; but ammonia applied in the autumn is lost. All fertilizers should be applied in a neutral form; lime is harmful to land, and so is sulphuric acid, but when applied in combination, as sulphate of lime, the water and air decompose it just fast enough, and all fertilizers should be in such neutral form that the forces of nature will dissolve them.

If we attempt to make superphosphate of lime by adding sulphuric acid to bone, we shall fail, but if we put water first, and then add the sulphuric acid, we shall succeed.

Leander Wetherell thought that when soil, unless of extraordinary depth, was trenched four feet deep, the vegetable humus was covered up.

Col. Wilson said that whenever the soil had been prepared so deep for certain kinds of fruits, the result was beneficial. For the strawberry it would be an advantage, but not for the grape.

Mr. Wetherell said that he has a good farm, and where he ploughed bound out grass land six inches deep, and harrowed the same way, and then applied the Stockbridge formula for corn, and harrowed again crosswise, and planted corn, he got one of the best crops he had ever had. An Ohio farmer said that he had never seen a better crop. There were eighty bushels to the acre, and the crop was not so great in seed as in growth. The late Moses Stebbins, of South Deerfield bought an old, worn out farm, in the Connecticut valley, with alluvial, where the surface was exhausted, and ploughed deep and turned up fresh soil to the increase of his crops. Mr. Stebbins recommended John Green, at Hadley, to plough deep, because of his own success, but Mr. Green's soil was light, with a gravelly subsoil and little humus, and when the plough was put down deep in that soil, the difference could be seen in the following crop; the humus was all turned under the gravel. Ploughing must be adapted to the soil.

Nitrogen is commercially the most valuable fertilizer; some forms are highly active and others slow in their action. Ammonia and nitric acid are the most active forms. Seventeen parts of ammonia contain fourteen parts of nitrogen. The speaker thought the amount of nitrogen taken from the air by plants very small; clover, however, is an exception. Corn and wheat give no perceptible proof of having absorbed ammonia from the air. Clover is deep rooted, and brings up food from the subsoil, and therefore is one of the best plants for turning under as a green manure. When it has been tried side by side with stable manure it has brought better corn. This is an important and fertile subject, and it is not exhausted. We want to retain the fertility of our farms and to save the cost of commercial fertilizers. The margin of profit in their use is too small. Professor Johnson says it is a question whether farmers can afford to pay the prices of commercial fertilizers. Professor Atwater says farmers use too much nitrogen.

Mr. Moore said that Col. Wilson had told us to begin with thorough preparation and drainage, but he supposed that drainage was understood to be necessary. He could tell by the appearance of plants whether they were suffering from too much water. He believed twenty inches as good a depth for stirring the soil as two feet or four feet. He knew that strawberry roots have run four feet deep, but they would not have gone so far if they could have found food nearer. Thirty or forty years ago farmers were told to plough fifteen inches deep for field crops, and they tried it and found it did mischief by covering up the fertilizers from the air, and the result would be the same if Col. Wilson should induce them to do so now.

Col. Wilson asked, by what rule are we obliged to prepare soil with a plough? There are cases where the soil must be stirred four feet in depth to gain the best results, as in making lawns. The question is, what depth of soil will hold so much moisture that the rain which falls on it will be sufficient for the wants of the crop. Strawberries and grass need a great deal of water; grapes need very little. In California, with a drought that endures all summer, vines in the vineyard will ripen thirty pounds of grapes to the vine, whereas in our moist climate many a man kills his vines with kindness by too constant watering. The preparation of the soil is the first element, and must be adapted to the crops.

There are chemical reactions in the soil whereby nitrogen is released. The great source of nitrogen is the atmosphere, which contains eight parts of nitrogen to one of oxygen, and in every expiration of animals all the oxygen is absorbed and almost all the nitrogen given off. Carbon has a greater affinity for potash than nitrogen in the form of ammonia or nitrates. If you put water into cologne it becomes turbid; alcohol and water have greater affinity for each other than alcohol and essential oils, and when potash in a caustic form is mingled with composts containing ammonia, the organic carbon in the compost combines with the potash, and the ammonia is at once released and lost.

Josiah W. Talbot said, in regard to the statement of the essayist that substances must be reduced to atoms before they can be taken up by plants, that the expression is not a good one. They must be either dissolved in water or be in the form of gas, and it makes very little difference which. It is admitted that all plants

are half or more carbon, and the question comes up, how is carbonic acid formed? The oxygen in the atmosphere takes hold of the carbon in the plant. When we stir the ground we admit air and it comes in contact with vegetable matter and changes it into carbonic acid gas, which is plant food. Many articles are dissolved in the soil and so taken up. Plants will send their roots down to where they can get moisture; the roots of elms have been found twenty-five feet down. Strawberries will go down to where they can get moisture, and in preparing ground we must go so deep that the sun will not dry the roots. In reclaiming the marshes at Marshfield the ground is sometimes cultivated only by harrowing when it is liable to suffer from drought. The peaty formation should be cultivated deeper.

Mr. Hersey said that by an atom he meant the smallest division of matter possible, though he might, perhaps, have said in solution, but he thought the paper showed fairly that plant food should be in solution. He had been experimenting more than thirty years in regard to the depth to which it is best to plough, and had come to the conclusion that every man must learn his own soil, and stir it as its condition requires. His own soil does not give as good results when stirred deep as when stirred shallow. He had land trenched two feet and a half in depth many years ago, which was injured thereby and still shows the injury. We can only learn general principles here and must go home and apply them according to the condition of our soils.

Hon. Marshall P. Wilder said that in cultivation we must begin with draining as the foundation of all success. Soil must be ploughed according to its nature, and must be properly prepared, and plant food given at the right time. The finer the manure is comminuted, the better; and it should be applied near the surface. The late Hon. Benjamin V. French tried the experiment of burying manure fifteen inches in depth, and never heard from it. The speaker had found by experience that it is better to have manure fine and on the surface, and applied in autumn. Air and water administered at the right time are the great constituents which cause growth.

William H. Hunt said that it is the experience of every farmer that it is difficult to get sufficient fertilizing material. Near Boston it is very expensive, and away from the city, with all the stock that can be kept, it is difficult to get enough. There is not suffi-

cient stable manure to go over the country. At Concord it costs eight dollars per cord, and the question is, whether to buy that or chemical fertilizers. He had bought and manufactured the latter largely, and we must resort to them. Dr. Nichols said that bone and potash make the cheapest and best fertilizer; ashes is the best form of potash, but sufficient cannot be had, and we must use muriate of potash. Farmers who want only a small quantity of chemical fertilizers would do better to buy them already mixed; but those who use a large quantity should buy the materials, and mix them. They cannot afford to use guano. We should plough about as deep as we can manure; in ordinary farm culture we seldom go down a foot; the speaker ploughs from five to eight inches in depth.

The Chairman of the Committee on Publication and Discussion gave notice that, on the next Saturday, Josiah W. Talbot would read a paper on "Sports Physiologically Considered."

BUSINESS MEETING.

SATURDAY, March 31, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, Hon. FRANCIS B. HAYES, President, in the chair.

E. W. Wood, Chairman of the Fruit Committee, reported in regard to the vote concerning fruits offered for Prospective Prizes, which was referred to that Committee at the meeting on the 3d of March, that it is inexpedient to take any action. The report was accepted.

The meeting was then dissolved.

MEETING FOR DISCUSSION.

SPORTS PHYSIOLOGICALLY CONSIDERED.

By JOSIAH W. TALBOT, Norwood.

Mr. President and Members of the Horticultural Society:

In presenting the following paper on Vegetable Sports, permit me, in justice to myself, to say that I lay no claim to new discov-

eries in vegetable physiology, but I simply present the facts and principles which I have gleaned from the best authors in our valuable library.

To call a natural phenomenon a *sport*, is to admit our ignorance of the natural laws by which it was produced. To be satisfied with that term evinces a willingness to remain ignorant. But such phenomena are very common. When, for instance, a branch upon the stock of a rose, or any other shrub or plant, produces a blossom essentially different from the others, it is called a sport. When, in grafting, the result is different from what we had reason to expect, we call it sporting. When the green leafed laburnum was budded with the golden, and the shoots below the bud, and even those from the roots were variegated, the new variety thus obtained was called a sport. So, when the yellow striped jessamine was grafted on the white, and the smaller leafed abutilon was grafted on the larger leafed, the two new varieties thus obtained were called sports. When, in Amherst, N. H., a large Baldwin tree, originally grafted near the ground on a Russet stock, threw out a shoot twenty feet above the graft, bearing apples that seemed to be a cross between the Baldwin and Russet, it was called Whiting's Sport, after the owner. Tradition tells us that more than a century ago, buds of the Golden Sweet and Rhode Island Greening, being split and their halves united, produced the well-known apple, one side of which is sweet, and the other sour. This apple has always been called a sport. These are a few of a large class of phenomena which, appearing to be contrary to natural laws, have been called sports. The term, however, is an unfortunate one. Nature never sports. All her laws are immutable. It is only when we cannot comprehend them that she *appears* to sport. Cases like the above, connected with grafting, cross-fertilizing, or hybridizing, will never be perfectly understood until men better understand the laws of vegetable anatomy and physiology. The advance made in this direction within a few years has already explained many of the mysteries of former times; and is it not reasonable to expect that scientific men, availing themselves of past discoveries, with the improved apparatus and opportunities of the present, will soon be able to trace what are now called sports, to natural causes? But let us bear in mind that the practical man, who carefully observes and records natural phenomena may be the scientific man, whatever he may be called.

The better to learn the origin, and understand the nature of sports, I wish to call your attention to a few familiar, but well-established physiological facts and truths. It is not long since the most absurd and contradictory views prevailed in regard to the circulation of the sap. That most trees and plants derive a large part of their nourishment from the soil, will not be questioned. Nearly all writers of note now admit that the crude sap ascends from the roots, through the sap wood, to the upper side of the leaves, where it is elaborated by coming in contact with the air, exhaling the superfluous water and oxygen, and inhaling carbonic acid. It then passes into the veins on the under side of the leaves, to be conducted into the chlorophyl vessels in the bark, where it is digested and assimilated on its way into the cambium, where it forms the protoplasm or life principle which circulates to every part of the plant, much as the blood circulates in the animal system. So well are botanists and physiologists agreed upon this subject, that controversy has nearly ceased. From this we obtain an idea of the source of the protoplasm, which originates not only all sports, but all growth in plant life. Another class of well established facts which we must understand before we approach the subject of sports, relates to the *cell structure* of plants. All plants originate in, and are composed of, minute cells. Every *natural* plant or tree came from *one* parent cell, which had the power of multiplying itself and building up the whole plant or tree. From every parent cell in a plant or tree, whether in root, branch, bud, or leaf, may be developed another plant or tree, which will be true to its kind. No *natural* plant or tree can of itself alone ever change its kind. On this fact depends the permanency of varieties. Keeping these facts in mind, we will now consider the *formation* of the cells. All writers admit that every cell is formed in the cambium by the protoplasm. According to their description, the protoplasm is one of the most wonderful agents in the world. They assure us that it has an inherent power of motion as persistent and independent as the beating of the heart, and even more so, for while the heart is always confined to the same relative spot, the protoplasm changes its locality and performs various kinds of motions, and seems to be endowed with a wisdom to foresee and plan, and a skill to execute the most varied operations. It not only forms the cells, but changes their forms to make tubes and vessels,

woody fibre, bark, buds and leaves; secretes the gum, starch, sugar, and all the materials that enter into the composition of plants; produces the most delicate blossoms, the most delicious fruits, and finally, to perpetuate its kind, inserts in every specimen of fruit a little embryo of itself in the well protected seed. All this is ascribed to the protoplasm. Men witnessing this wonderful display of wisdom and skill everywhere seen have called it *Nature*, and bowed in reverence; but let us rather view it as the handiwork of the Infinite One, whose wisdom designed, whose power executes and upholds, and whose boundless love pervades the whole. Or with the poet, exclaim,—

“All are but parts of one stupendous whole,
Whose body Nature is, and God the Soul.”

But that protoplasm is the agent by which all vegetable growth is carried on, must be admitted. By the improved microscope, we can actually witness the wonderful process. We can see the first step toward the formation of a cell. We can see the protoplasm in the cambium, as it forms itself into a little globe or ball to become the nucleus of the future cell. We can see it begin to rotate and take form, as it secretes the substance with which it surrounds itself with a cell wall as perfect as the shell of an egg. Thus the nucleus, the cell sap, and the cell wall, constitute a *parent* cell. The nucleus is simply living protoplasm, which, as soon as the first cell is completed, divides itself into two parts, each taking an end of the cell, begins its rotary motion, divides the cell wall, and from the half each forms a new cell as perfect as the first. Thus from one cell two are formed, each to be again divided, and thus on to infinity. But when a sufficient number of cells are formed, one above another, a new work commences, with which we are particularly interested. The protoplasm in the perpendicular row of cells begins to absorb the transverse septa or end walls which are in contact with each other, and joining the side walls together forms tubes or sap vessels; then passes up through the tubes thus formed and uniting recommences its work of cell building to complete the plant or tree. It is the *union* of the protoplasm or the contents of these cells as it absorbs the cell walls between them and recommences cell building, that gives the key to the origin of sports. It is a process which is constantly going on in plant growth. Beyond the simple formation of cells, this union seems to be the means of the most important changes.

To illustrate: The grains of pollen in a blossom are admitted to be independent male cells, which may be removed from one plant to another. In the same blossoms where the male cells are formed, are the ovules or female cells, which cannot be removed without destroying them. These male and female cells are not independent parent cells, *i. e.*, they cannot by division form other cells. *Separately* they can do nothing toward building up the tree, but soon perish. But bring the pollen or male cell in contact with the ovule or female cell, and they at once absorb the cell walls between them, unite their contents, and together form a new cell, which is the embryo or parent cell of a new plant. In this way every seed is formed by the union of the contents of two cells. And here we may see how no plant can, of itself, ever change its kind. If the pollen, or male cell, uniting with the female cell be of the same kind, then the embryo or seed cell must be the same, and the plant will be the same. But let the pollen or male cell be of a different variety, and although they will unite in the same way, yet the embryo or seed cell will be unlike either. It will be a mixed or hybrid cell, and the plant coming from it will be like it. Thus we see that all hybrids come from the union or mixing of the contents of two cells. The same is true of all cross-fertilized seeds. Two cells of different varieties unite to form a seed cell; hence the term "variety hybrid," applies to every crossed variety.

Now, we wish to examine this union of cells a little more. When two cells thus unite, each contains a nucleus which appears to be little more than a small collection of protoplasm. But what gives this little particle of protoplasm in the male cell the power to produce such different results when uniting with female cells of different varieties? Or, in other words, what *determines* the *kind* of the embryo cell thus formed? In a natural tree, isolated from all others, every seed or embryo will be true to its kind. But in a grafted tree bearing several kinds of fruit, perhaps no two seeds will produce the same kind. Now every nucleus or primordial cell is formed in the protoplasm, and it would seem that the protoplasm should determine the kind, but this is not the fact. Neither is it the root that affords the sap, nor the leaf that elaborates it, nor the protoplasm formed from it. I have a natural pear tree, which, many years ago, was grafted with the St. Michael. When that pear cracked so badly, I grafted it with the Dunmore. Not satisfied with that fruit, I grafted it again with

the Anjou. Thus, I have four kinds of pear wood growing one above the other. The wild stock furnishes all the sap that passes up through the four kinds of wood, which is elaborated, digested, and assimilated by the Anjou leaves and branches, and forms protoplasm in the cambium of the Anjou top. It is certainly Anjou protoplasm, for it forms Anjou cells, buds, fruit, and wood. But this same Anjou protoplasm passes down a little lower, and forms Dunmore cells, buds, fruit, and wood; still lower, it forms St. Michael cells, buds, fruit, and wood; lower still, the wild fruit of fifty years ago is found. And this all takes place when there are only Anjou leaves on the tree. Now when the protoplasm leaves the Anjou top, it is full of primordial cells formed there, which, if matured there, would be Anjou. What changes their nature as they pass down? I come to the conclusion that each kind of wood must have an inherent power to determine its own kind of fruit, and that the nuclei or primordial cells have their kind determined by the wood where they are *matured*, and not where they originated. Every kind of wood imparts something to every parent cell matured in it that determines what kind of fruit the tree coming from it shall bear. And every tree coming from such a cell must be true to its kind. Now if there is any way by which the contents of two cells, determined by different kinds of wood, should be united, would not the union be a hybrid? We have already seen that such a result follows in hybridizing and cross-fertilizing. We have also seen that in building up a tree, the cells often, yea, constantly, absorb the cell walls between them, and unite their contents, and proceed to form new cells by their united contents. Now we are constantly bringing such different cells in contact by the process of grafting, and it is in grafted trees that sports are generally, if not always, found. A cell in a scion is placed in contact with a cell in the stock; they absorb the cell walls between them, unite their contents, and these proceed to build a strain of wood different from either; in time, this blossoms and bears fruit, uniting the qualities of both scion and stock. It is a graft hybrid, but is called a sport. I think all sports come from a *union* of cells of different varieties. We may not always trace this. As in the animal kingdom, the mixed strain may reach far back—sometimes over several generations—so in plants; the strain may not become apparent for years, but when it appears it gives a new variety. But there is another

union of cells to which I wish to refer. A bud is virtually a single parent cell in its winter costume, with its spring ration enclosed. These bud cells may be split, and the halves of different ones united, thus mixing their contents as effectually as in hybridizing. Mr. Meehan assures us that he has done it. During the last season, I split the buds of several kinds of apples, and united them, and have three united buds living. I cannot tell what kind of fruit they will bear, but I know that halves of different buds united and grew well. This is a union of different cells, and I see no reason why their substance did not unite to form a parent cell which multiplied itself to build up the shoots just as any other cell does, and I cannot see why it will not be a mixed or hybrid wood, and bear a mixed or hybrid fruit. If so, I shall not call it a *sport*, but a graft hybrid. And such are all sports. They are hybrids resulting from the union of different cells. This certainly applies to the variegated laburnum, jessamine, and abutilon, which we know were the result of grafting, and I think equally well to the rose, the apple, and all other sports. I come to this conclusion from the truths and principles found in the works of the most distinguished authors in our valuable library. Most of these authors speak of sports and graft hybrids, but none attempt to account for them except Ex-President Clark of our own college, and he, rather doubtfully, in his report for 1870, says: "It may be possible that a part of a cell of the scion may unite with a part of the cell of the stock, and form a kind of mechanically crossed cell, capable of reproducing itself in infinite variety." This "infinite variety" is foggy. If he had said, capable of producing a *new* variety, it would have been nearer the truth. But if he had considered what he had already stated about the union of cells by the absorption of their transverse septa, he would have seen that it is not necessary to take *parts* of cells, but that by simply bringing cells of different varieties together, they will often absorb the intervening cell walls, unite their contents, and form a mixed cell producing a new variety, and all that is mechanical about it is the method by which the cells are brought in contact. From the foregoing, I conclude that all vegetable sports are *hybrids*, produced by the natural union of cells of different varieties, and that when more familiar with the subject, we shall no longer call them Sports but Hybrids.

DISCUSSION.

Hon. Marshall P. Wilder said that he had been more interested in the paper just read than he expected to be. He had heard a good deal about cell matter, which he had not intelligence enough to understand; but Mr. Talbot had so systematized his facts in regard to physiology, and stated them in such a sensible way, as to make his paper a remarkable one. His method of accounting for the production of four different kinds of wood in the pear tree, by the cell being *matured* in the wood formed, the speaker thought correct. We all know how cells are produced and conjoined, but he had not so well understood the process by which sports are produced, and that whether they are called hybrids or sports, the process is the same. He had had much experience in producing new varieties, and some sports which he has fixed may have come from such a union of cells as the essayist had described.

D. W. Lothrop said that he had been exceedingly interested in the paper. The subject is very complicated—as much so as anything in science, except that of soils. Many German writers seem to be trying to explain old mysteries by new phrases. The moment you can produce a sport, you show that you understand the laws which govern it. If we cannot get positive evidence on the subject, we may get negative. There is no certainty in regard to sports; when we arrive at certainty regarding them, they cease to be sports. It makes no difference what name is given to them. The speaker has a grafted tree, on which all the grafts have shown themselves the same as he put in, except one branch, which has not yet borne, is different in leaf, and will probably prove a sport, or what Professor Gray would call a bud variety. But such phenomena cannot be produced at will. The cell process does not make it clear how the sweet and sour apple was produced. Mr. Meehan's process, by splitting the graft through the bud, is legitimate and natural, and can be effected, as is known. Mr. Coxe (*View of the Cultivation of Fruit Trees*, page 22,) says he has seen an apple in which the properties of the Newtown Pippin and a Russeting were mixed by the accidental intermingling of the branches of two trees growing in an orchard at Trenton, N. J.; one end of each apple was strongly marked externally by the character of the Russet parent; the other equally resembled the Pippin, and the flavor and juice of each end corresponded exactly with its external appearance. Here is extraneous influence, from

pollen, or otherwise, affecting the *fruit*, and it seems to be accidental or abnormal in nature, and could not be produced at will. We sometimes see an apple shaped like a pear; this is a sport not explained by the cell process, and which nobody can produce. It may be that where two branches from two trees come together, the pollen may have fructified and affected the shape of the fruit (not the seed) the same year.

Mr. Talbot did not believe in accidents in nature. When we understand the laws which govern variations, it is not proper to call them sports. The best authorities speak of species hybrids, or mules, and variety hybrids or crosses. He did not believe in bud variations; a bud is a cell with other appendages, and the vital part is a single cell, which divides in the spring and carries on growth. He could not see how the pear-shaped apple could be produced by pollen, but by combining one cell with another it could be produced. Hybridizing was formerly looked on as being as mysterious as these things are thought now. He brought up the subject to call attention to facts recorded from twenty to forty years ago.

C. Terry asked how a bud could be split without destroying it.

Mr. Talbot said that he split twelve buds, and that in three cases they united, and are now living. In two cases where he joined halves of buds on a scion, and inserted the scion in another stock, they did not live. The foliage produced by the split buds is slightly different from that of the stock. The contents of the buds have united.

Charles M. Hovey denied that all sports are hybrids, and said that it is folly to assert it. If a bud is cut in the germ, it will be destroyed. The flowers now in the fruit buds were formed last summer, and the wood buds the same. There is an infinitesimal point in a seed—of a cucumber, for instance,—which, if cut through, the germ will be destroyed. The difference between a hybrid and a cross is that, in the former, two species are united, and in the latter, two varieties. The product of the former is termed a mule, but sometimes it will produce seed. When we cross-fertilize a camellia or a strawberry, we get something between the two varieties crossed. An oak throws out a variegated leaf; where did it get the white leaf? A chrysanthemum may be propagated for ten years by cuttings, and not by seed, and by and by a yellow flowered plant produces a white one, and the two come

out simultaneously. The *Browallia* will sometimes produce a branch with white flowers. These are all things of which we know not how they are done, but the speaker hoped we might find out. Some things are yet unfathomable; we cannot find out the law by which a wild stock, when grafted, produces eight or ten varieties of fruit, and all distinct. Van Mons did not believe in hybridizing; why did his seedlings vary?

Mr. Talbot replied to Mr. Hovey's last query, that Van Mons planted the trees which produced his seeds alongside of other varieties.

Mr. Wilder agreed with Mr. Talbot that Van Mons must have planted his trees in his garden with other varieties.

Mr. Hovey said that geraniums and other plants grown in greenhouses where there are no other varieties, will vary when grown from seed. Nature has provided against the chance of flowers not being fertilized, by a surplus of stamens, as in all the *Rosaceæ*, and there is no need of foreign fertilization; three-quarters of them do their own fertilization. Variations take place without regard to hybridization, not only in the vegetable world, but throughout creation.

William C. Strong was called on, and said that he was not inclined to speak, because he felt the danger of expressing crude opinions. He felt under obligations to the essayist for his paper, but was not ready to follow it. As regards hybridization by different kinds of protoplasm producing the different varieties in seeds, we may, perhaps, agree. But to divide, and afterwards to cross in an artificial way, admits of very grave doubts. To split a single cell would destroy it.

Mr. Talbot said that Mr. Strong did not make the distinction between protoplasm and the beginning of a cell. One single cell divides and makes other cells, called the parent cell. If we can divide that and unite another half cell with it, it makes but a single cell.

Mr. Hovey asked Mr. Talbot whether he had ever attempted to divide a fern spore.

Mr. Talbot replied that he had not, and added that every seed is a compound cell.

Mr. Strong controverted the point made by the essayist, that nature never changes without the introduction of a new element, and that there can be no variation but by the union of two varie-

ties. Protoplasm may be modified. Sports are found most frequently on grafts, as in the case of the four kinds of pears on one stock, and are not caused by hybridization, but the nature of the plant is changed. Men change by age; why should not plant cells grow larger by cultivation? The condition of the soil changes; the color of a coleus may be heightened by the soil.

Leander Wetherell quoted a remark made by Professor Agassiz at a farmers' meeting, that the term hybrid is properly applied only to the intermixture of two species; when two varieties are intermixed, it is a cross. The speaker urged the necessity of using words with exactness and accuracy.

Mr. Hovey said that pears and other fruits are generally self-fertilized, though Darwin thinks self-fertilization insufficient. Red clover and white never cross. Nature has done everything to produce self-fertilization, so that there should be no failure in the continuation of any plant.

Mr. Talbot asked why, if any accident should occur, varieties should not get mixed up? The laws of nature prevent the red and white clovers from crossing.

Benjamin G. Smith, Chairman of the Committee on Publication and Discussion, announced that this would close the meetings for discussion the present season.

President Hayes thought it proper that the Chair should express the thanks of the Society to the Committee on Publication and Discussion, from whose action it has received so great advantage, and it was pleasant to him to bear witness to the benefit which these discussions have conferred, not only on those who have attended them, but on the whole country. Never before has the Society done so much for the diffusion of information on horticulture. All are not educated up to the same plane, and this morning we have been groping into Nature. He congratulated the Society on what had been accomplished at these meetings, and said that since their commencement, the Society had been especially indebted to Ex-Presidents Wilder and Strong for the part they had taken in sustaining them.

Mr. Wilder said that his heart was alive to this subject, and he thanked the President for his constant attendance at the meetings, and the Committee for the zeal and energy that they had shown. The reports have been distributed through the country every week, and have been largely copied in the journals of the day. Great as

have been the benefits of our exhibitions, the Society has never done anything so popular as the holding of these useful and instructive meetings. If we could not by this means procure the information they have afforded, we might be unable to obtain it at all. Mr. Wilder said that he should not attend these meetings a great while, but urged the Society to go on with them through coming time; it is in the right way, and should follow it.

Rev. A. B. Muzzey said that as one of the oldest members of the Society, and as a former member of the Committee on Publication and Discussion, he thought it but justice to the Society, and to those who have had charge of the meetings, to say that never before have they been so successful, so well attended, and productive of so much advantage. Never before have we been honored with the constant presence of the President of the Society. The Committee must have spent a great deal of time in perfecting their arrangements, and have never had so much success in selecting good essayists. The speaker was delighted to see that the Society has the coöperation of the community in its efforts to diffuse information on horticulture. He offered the following vote:

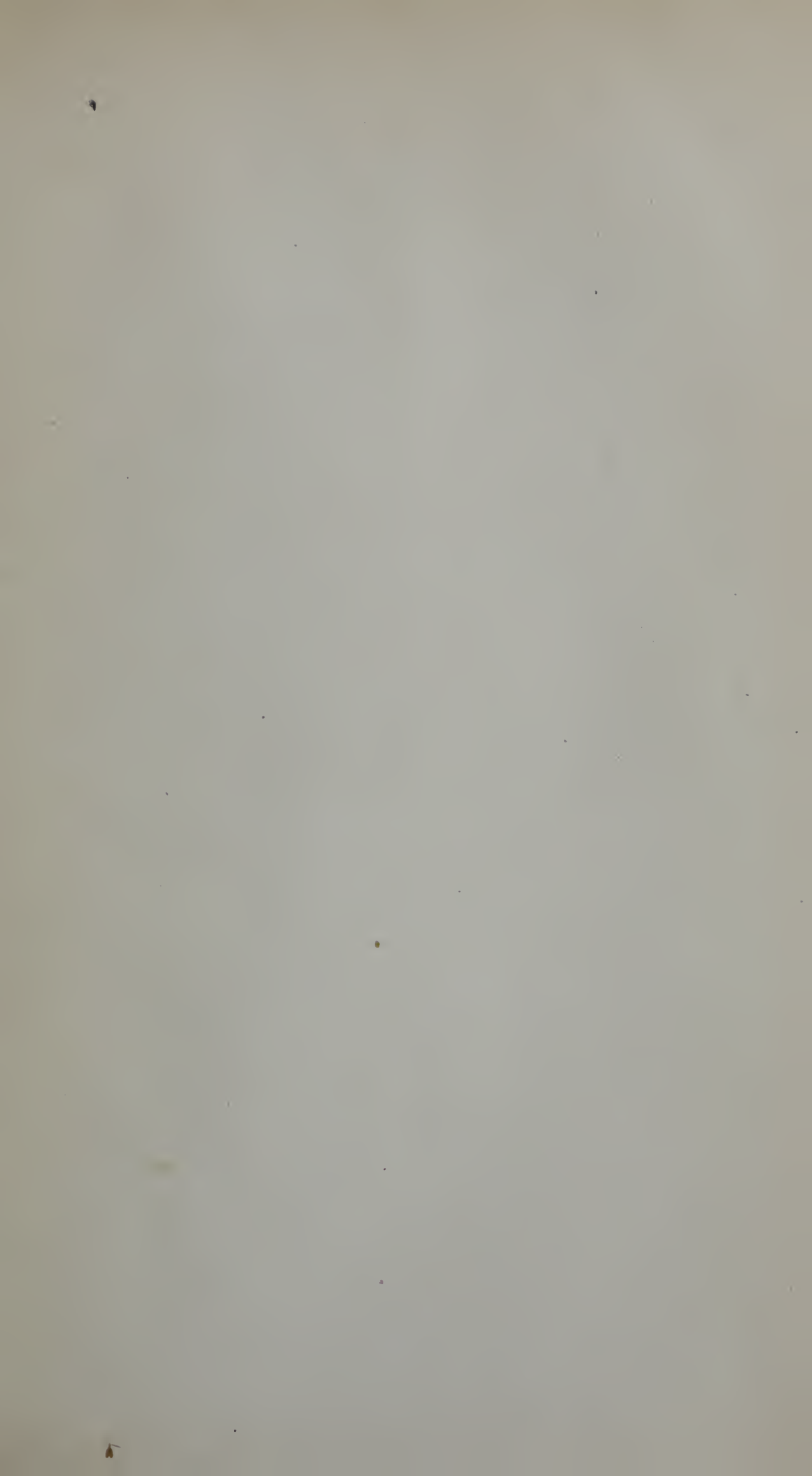
Voted, That the thanks of the Society be given to the President, the Hon. Francis B. Hayes, for his constant presence at the discussions, and the impartial, courteous, and faithful manner in which he has presided over these meetings. Also, that our thanks be expressed to the Committee on Publication and Discussion for their wise selection of readers and the valuable papers given us through the season. Also, that we express our thanks to our Secretary for his admirable reports of the meetings and his devoted services in all his duties, in which he has labored to the detriment of his health; and we express our hope that he may, by rest and recreation, be restored to pursue his invaluable work.

The vote was unanimously passed, and the meeting then adjourned without day.

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A HISTORY OF AMERICAN HORTICULTURE.

The attention of Trustees and Librarians of Public Libraries, and of Horticulturists generally, is called to the History of the Massachusetts Horticultural Society, for fifty years, from its foundation in 1829. This work will be found of general interest, as the introduction comprises a sketch, much fuller than exists elsewhere, of the History of Horticulture in the United States, from the settlement of the country to the foundation of the Society, and the history of the Society onward is, in the language of President Hovey, in his address at the dedication of the present Hall of the Society, "the History of Horticulture in our country." It is handsomely printed, on an extra quality of paper, and embellished with a fine steel engraving of Gen. H. A. S. Dearborn, the first President, and heliotypes of the two Halls erected by the Society. Among other interesting matters, it contains an account of the foundation by the Society of Mount Auburn Cemetery, the parent of all similar cemeteries in the country.

The work is furnished to members of the Society, at cost, \$2.50, and to others than members for \$3, but will be supplied to public libraries and booksellers at the same price as to members. Please address the Secretary of the Society, at Horticultural Hall, Boston.

ROBERT MANNING,

Secretary.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1883.

PART II.



BOSTON:
PRINTED FOR THE SOCIETY.
1884.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1883.

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BOSTON:
PRINTED FOR THE SOCIETY.
1884.

The Committee on Publication and Discussion, take this opportunity to repeat what they have heretofore stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature, in the papers and discussions now or before published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly. The award of a prize or gratuity for an Essay is not to be understood as implying that the Committee approve it in every particular, but only that they believe it calculated, *on the whole*, to promote the science or art of Horticulture.

BENJAMIN G. SMITH, *Chairman.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 7, 1883.

A duly notified stated meeting of the Society was holden at 11 o'clock, Hon. FRANCIS B. HAYES, President, in the chair.

Hon. Marshall P. Wilder, President of the American Pomological Society, presented a circular announcing that the Nineteenth Biennial Session of that Society would be held in Philadelphia, September 12, 13, and 14, and moved the appointment of a delegation of twenty-five from this Society, of which the President should be chairman, to attend the meeting, the delegation to have power to fill vacancies in their number. The motion was carried, and Mr. Wilder, Robert Manning, and E. W. Wood, were appointed a Committee to nominate delegates.

John B. Moore moved that Ellwanger's "Treatise on the Rose" be made the standard of classification of all roses exhibited for the Society's premiums. The motion was referred to a Committee consisting of Mr. Moore, William H. Spooner, E. W. Wood, J. H. Woodford, and Edward L. Beard.

The appropriations recommended by the Executive Committee at the meeting on the 4th of November, 1882, were taken up, and voted by the Society, as follows:—

For Prizes and Gratuities,

| | |
|--------------------------------------|--------|
| For Plants and Flowers, | \$1500 |
| “ Fruits, | 950 |
| “ Vegetables, | 500 |
| “ Gardens and Greenhouses, | 100 |

| | |
|--|-----|
| For the Committee on the Library, for the purchase of magazines and newspapers, binding of books, continuing the card catalogue of plates, and incidental expenses of the Committee, | 400 |
| For the Committee on Publication and Discussion, | 150 |
| For the expenses of the Committee of Arrangements, | 300 |

Dr. HORATIO C. MERIAM, of Salem, and
AMOS E. HILL, of Belmont,

having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

Adjourned to Saturday, May 5.

BUSINESS MEETING.

SATURDAY, May 5, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, Hon. FRANCIS B. HAYES, President, in the chair.

The Committee appointed at the last meeting to select some book as a standard authority for the guidance of committees and exhibitors in the classification of roses, reported through their Chairman, John B. Moore, that they had examined various works on the rose, and after careful consideration unanimously recommended to the Society to adopt as such standard, Ellwanger's "Treatise on the Rose."

The report was unanimously accepted and adopted.

The President communicated a letter from the President of the Imperial Russian Horticultural Society, containing more fully the information received by telegraphic cable, on the 10th of March, that the International Exposition of Horticulture and Congress of Botanists and Horticulturists, fixed for the present month, in celebration of the Twenty-fifth Anniversary of that Society, had been postponed until next year, on account of the coronation of the Emperor and Empress of Russia at Moscow during the month,

and expressing the hope that the representatives of this Society would be present next year.

Adjourned to Saturday, June 2.

BUSINESS MEETING.

SATURDAY, June 2, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, Hon. FRANCIS B. HAYES, President, in the chair.

C. H. B. Breck announced the decease of Parker Barnes, one of the oldest members of the Society, and moved the appointment of a committee to prepare memorial resolutions. The motion was carried, and the Chair appointed as that Committee, Mr. Breck, William H. Spooner, and John B. Moore.

Hon. Marshall P. Wilder exhibited two colored plates of a large number of double and single varieties of Tuberos Rooted Begonias, and spoke of the recent great improvement in these plants, and of their value for the summer decoration of gardens and ornamental grounds.

The following named persons having been recommended by the Executive Committee were, on ballot, duly elected members of the Society :

FRANCIS W. MORANDI, of Malden.

GEORGE W. WELD, of Newport, R. I.

SAMUEL A. D. SHEPPARD, of Newton.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, July 7, 1884.

A duly notified stated meeting of the Society was holden at 11 o'clock, Hon. FRANCIS B. HAYES, President, in the chair.

Hon. Marshall P. Wilder, Chairman of the Committee appointed on the 7th of April to report a list of delegates to the meeting of

the American Pomological Society at Philadelphia, on the 12th, 13th, and 14th of September, reported the following :

The President, Hon. Francis B. Hayes, Chairman.

| | |
|--------------------------|----------------------|
| Hon. Marshall P. Wilder, | Warren Fenno, |
| Charles M. Hovey, | John C. Hovey, |
| James F. C. Hyde, | E. P. Richardson, |
| William C. Strong, | James W. Clark, |
| John B. Moore, | Aaron D. Capen, |
| Benjamin G. Smith, | Henry W. Wilson, |
| C. H. B. Breck, | John A. Demar, |
| E. W. Wood, | Nelson B. White, |
| P. Brown Hovey, | John H. Moore, |
| Charles F. Curtis, | Charles N. Brackett, |
| J. W. Manning, | William H. Spooner, |
| O. B. Hadwen, | Warren Heustis. |

The report was accepted, and the Committee was empowered to appoint substitutes for such delegates as might be unable to attend.

Edward L. Beard said that the project of holding a grand exhibition during the year 1884, not only of horticultural products but of plant houses, heating apparatus, and all other objects appertaining to horticulture, had been discussed by some of the members of the Society, who believe that, occupying as it does a foremost place among American horticultural societies, it should take such a step in advance. He thought it probable that contributions could be secured from Europe, and felt certain that such an exhibition would be the means of diffusing much needed information on horticulture. On motion of John B. Moore, seconded by William H. Spooner, the following named persons were appointed a Committee to consider the subject: Edward L. Beard, Marshall P. Wilder, H. H. Hunnewell, F. L. Ames, Charles M. Hovey, John B. Moore, William H. Spooner.

The following named persons having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society :

SPENCER W. ROBINSON, of Boston.
 RHODES LOCKWOOD, of Charlestown.
 FRANCIS C. FOSTER, of Cambridge.

Adjourned to Saturday, August 4.

BUSINESS MEETING.

SATURDAY, August 4, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

Robert Manning was added to the delegates to the meeting of the American Pomological Society.

Hon. Marshall P. Wilder announced the decease of Dr. John A. Warder, of North Bend, Ohio, a Corresponding Member of the Society, and moved the appointment of a Committee to prepare memorial resolutions, and Mr. Wilder, Charles M. Hovey, Robert Manning, and Leander Wetherell were appointed as that Committee.

On Mr. Wilder's motion, also, a Committee, consisting of Aaron D. Capen, E. W. Wood, and Charles N. Brackett, was appointed to prepare resolutions in memory of Lemuel Clapp.

David W. Lothrop announced the decease of George Craft, and moved the appointment of a committee to prepare a memorial, and Mr. Lothrop, John C. Hovey, and John G. Barker were appointed as that Committee.

Agreeably to the Constitution and By-Laws the President reported the following Committee to nominate suitable candidates for the various offices of the Society for the year 1884: Hon. Marshall P. Wilder, Chairman, Henry P. Walcott, William H. Spooner, Henry Ross, George Hill, Joseph H. Woodford, Edward L. Beard.

GEORGE A. PURDIE, of Wellesley Hills, and
JAMES H. BOWDITCH, of Brookline,

having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

Adjourned to Saturday, September 1.

BUSINESS MEETING.

SATURDAY, September 1, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, Hon. FRANCIS B. HAYES, President, in the chair.

Hon. Marshall P. Wilder, Chairman of the Committee appointed at the last meeting to prepare resolutions in memory of Dr. John A. Warder, reported as follows:—

The Committee appointed to prepare resolutions on the death of Dr. John A. Warder, a Corresponding Member of this Society, beg leave to report:

Dr. Warder died at his residence, North Bend, Ohio, July 14, 1883, aged seventy-one years. He was born within the limits of Philadelphia, and was for many years a beloved physician in Cincinnati, until his removal to his farm, a part of which was formerly President Harrison's. He was a Vice-President of the American Pomological Society, an Ex-President of the Cincinnati Horticultural Society; President of the Ohio Pomological, now the State Horticultural, Society; founder and President of the American Forestry Association, until last year when it became the American Forestry Congress; and a member of many other associations. Dr. Warder was a student of nature, deeply interested in landscape gardening, and the improvement of our cemeteries, and also in the work of various scientific and educational institutions, and had been recently appointed by the United States Department of Agriculture, as Forestry Agent for the investigation of American Forestry; Therefore be it

Resolved, That in the death of Dr. John A. Warder, a Corresponding Member of this Society, we have to deplore the loss of one of nature's noblemen, unselfish and generous, devoting his whole life to the good of others. We recognize his fondness for scientific investigations, his contributions to various literary and medical publications, and especially his valuable works on American Pomology and American Forestry.

Resolved, That in this bereavement we have lost a man of fine social qualities, whose society was greatly enjoyed by all who knew him, and we would here express our heartfelt sympathy with the family of the deceased.

Leander Wetherell desired to add his testimony to the worth of Dr. Warder, whom he first met in Rochester, N. Y., about 1845. He knew him to respect and honor him. He was of Quaker ancestry, and his father entertained Audubon, William Bartram, and Nuttall, and they inspired the son with a love of nature and science. His publications on forestry, of which a list was printed in the August number of the "Journal of Forestry," are numerous, and

form almost a library on that subject; and it is an important question who shall fill his place in the study and investigation of that department of rural economy. He was chosen a Corresponding Member of this Society in 1869, and was a gentleman whom we all delighted to honor, and it becomes us to pay him the respect which he so richly deserved.

William C. Strong confirmed all that had been said by the last speaker, and in the resolutions, in praise of Dr. Warder.

Mr. Wilder said that Dr. Warder was a remarkable and most useful man, and that in his death he had lost a very dear friend, who always made the house of the speaker his home when he visited Boston, and who, when he was sick, came in loving kindness to watch over him not only in his home, but by his bedside in Washington.

President Hayes desired from his official position to acknowledge in behalf of the Society, the great worth of Dr. Warder, and the benefit conferred by him on the Society, which is indebted to him for instruction on a novel subject, and deeply deplores his loss.

The resolutions were unanimously adopted.

Aaron D. Capen, Chairman of the Committee appointed at the last meeting to prepare a memorial of Lemuel Clapp, presented the following :

The Committee appointed to take suitable notice of the death of Lemuel Clapp, respectfully report :

Lemuel, the son of William and Elizabeth (Humphreys) Clapp, was born in Dorchester January 21, 1815, and died June 15, 1883. He, with his brothers Thaddeus and Frederick, was largely interested in agricultural and horticultural pursuits. He planted with his own hand the seed from which the Clapp's Favorite pear originated.

It is not often that we have to record the death of one whose departure will be the occasion of greater sorrow in the circle in which he moved. The loss of his efforts in behalf of the Massachusetts Horticultural Society will be seriously felt.

He was beloved by his family and many personal friends, and highly respected by all who knew him, as a gentleman not only above reproach but above the suspicion of it. Many have made more show and noise in this world, but few have left it with a cleaner record.

AARON D. CAPEN, }
 E. W. WOOD, } *Committee.*
 C. N. BRACKETT, }

Mr. Wilder said that he knew Mr. Clapp well as a worthy citizen of Dorchester. He was the last of three brothers noted for their excellent character and their skill as horticulturists. Although Thaddeus Clapp has the credit of producing the Clapp's Favorite pear, the seed of this and all the other fine seedling pears which have originated in the grounds of the Clapp brothers was planted by Lemuel. He is a loss to the community and especially to American Pomology.

The resolutions were unanimously adopted.

William H. Spooner, from the Committee appointed at the meeting on June 2d, to prepare resolutions in memory of Parker Barnes, reported the following :

Resolved, That in the death of Parker Barnes, the Massachusetts Horticultural Society has lost a member who for many years took a lively interest in its welfare and prosperity.

Resolved, That while we sympathize deeply with the family and relatives of the deceased, in this dispensation of Providence, we rejoice in the full belief that he has passed to a higher and more glorious state of existence.

Resolved, That these resolutions be entered on the records of the Society, and that a copy be transmitted to the family of the deceased.

C. H. B. BRECK,
Chairman of Committee.

Mr. Wilder said that he knew Mr. Barnes as a lover of Nature fifty years ago. He afterwards was much interested in the dahlia, of which he had one of the most extensive collections and was one of the most successful cultivators. Later he became a seedsman, and was instrumental in the distribution of both seeds and plants of beautiful flowers.

Robert Manning, the Librarian, took from the library a little book, presented by Mr. Barnes on the 10th of October, 1882—“The Young Florist, or Conversations on the Culture of Flowers and on Natural History, with numerous engravings, from original designs: By Joseph Breck, Superintendent of the Horticultural Gardens, Lancaster, Mass.” It was published at Boston, in 1833, and bore the following inscription on a fly-leaf: “This book was the cause of the development of my love for flowers: Parker

Barnes, May 5, 1863;" thus forming an interesting memorial of the author and the giver, two of the oldest members of the Society.

The resolutions were unanimously adopted.

The Committee appointed at the last meeting to prepare resolutions in memory of George Craft, reported through their Chairman, David W. Lothrop, as follows :

The Committee appointed at the last meeting to present resolutions to the Society on the decease (July 21, 1883) of Mr. George Craft, of Brookline, would make the following report :

Resolved, That on the death of Mr. Craft, long a member of this Society, we would express our sorrow for the loss of one who, during the greater part of his life, took a deep interest in agriculture and horticulture, and in the various arts and sciences to which they are allied, holding for several years a place on the Flower Committee of our Society. In early life he was much interested in the cultivation and sale of ornamental trees and shrubs, and in a later portion of his life in that of flowers, particularly the Gladiolus, raising many fine seedlings thereof, in which industry he was very prominent, if not the pioneer, taking many prizes, certificates of merit, and several medals, as our annual reports abundantly testify. In the allied art of landscape gardening, he manifested much pride and pleasure, and exhibited the marks of his discriminating taste in everything of this nature which he undertook. But aside from his love of horticulture, the members of this Society, and those who knew him best, will remember him for his self-culture, industry, and ingenuity, his frankness and modesty, his cheerful companionship, his unsullied reputation, his interest in many philanthropic associations, and his general devotion to the higher elevation of man.

Resolved, That these resolutions be entered on the records of the Society, and that a copy be forwarded to the sister of the deceased.

| | | |
|-----------------|---|-------------------|
| D. W. LOTHROP, | } | <i>Committee.</i> |
| JOHN C. HOVEY, | | |
| JOHN G. BARKER, | | |

The resolutions were unanimously adopted.

Hon. Marshall P. Wilder, Chairman of the Committee to nominate candidates for Officers and Standing Committees for the next year, reported a printed list, which was accepted and laid on the

table. It was voted that the Committee be continued and requested to nominate candidates in place of any who might decline before the election.

William H. Spooner announced that Charles H. B. Breck had declined a renomination as Chairman of the Committee of Arrangements, after having filled that important position acceptably and courteously for many years, and offered the following resolve, which was unanimously passed :

Resolved, That the thanks of the Society be presented to Charles H. B. Breck, for his long term of service, of seventeen years, as Member and Chairman of the Committee of Arrangements.

The following named persons, having been recommended by the Executive Committee as members of the Society, were, on ballot, duly elected :

DANIEL WRIGHT, of Lowell.
HOSEA WATERER, of South Natick.
Mrs. MARY LANGMAID, of Somerville.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, September 22, 1883.

A special meeting of the Society was holden at 11 o'clock, in accordance with the following request :

BOSTON, September 18, 1884.

To Hon. FRANCIS B. HAYES,

President of the Massachusetts Horticultural Society :

Agreeably to Section XI of the Constitution and By-Laws of the Massachusetts Horticultural Society, the undersigned twelve members request you to call a special meeting of the Society, to see if the Society will authorize the execution of a mortgage on its estate on Tremont Street, Boston, between Bromfield and Bosworth Streets, for \$60,000 for five years, at $4\frac{1}{2}$ per cent interest.

| | |
|----------------------|-------------------|
| Marshall P. Wilder, | John Fillebrown, |
| Charles H. B. Breck, | Robert Bottomly, |
| John G. Barker, | M. W. Chadbourne, |
| George Hill, | D. A. Martin, |
| George W. Fowle, | David Allan, |
| Robert Manning, | Samuel G. Damon. |

In compliance with this request the President ordered that a Special Meeting be held on Saturday, September 22, at 11 o'clock, for the purpose therein mentioned, and that the notice required by the Constitution and By-Laws be given by an advertisement signed by the President, which was accordingly published three times in the Daily Evening Transcript, and three times in the Boston Daily Advertiser, and a notice of similar tenor was posted in the Library Room.

At this meeting the President was in the chair, and stated the object of the meeting to be to execute a mortgage and note, as mentioned in the call for the meeting. The mortgage and note were read in full by the President, and on motion of Aaron D. Capen it was unanimously

Voted, That Francis B. Hayes, the President of this Corporation, and George W. Fowle, the Treasurer of this Corporation, be, and they hereby are, authorized and directed to execute, acknowledge, and deliver, the foregoing mortgage as the free act and deed of this Corporation—to execute the note therein described, and transfer the policies of insurance as additional security, as therein set forth.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, October 6, 1883.

A stated meeting of the Society, being the annual meeting for the choice of officers, was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The Recording Secretary stated that the requirements of the Constitution and By-Laws, in regard to notice of the meeting, had been complied with.

The President appointed William H. Spooner, George Hill, and Robert Manning, a Committee to receive, assort, and count the votes given, and report the number.

The polls were opened at five minutes past eleven o'clock.

Charles H. B. Breck reported from the Executive Committee a recommendation that the sum of \$150 be appropriated for the deficiency in the appropriation for the expenses of the Committee of

Arrangements for the years 1881 and 1882, and the appropriation was voted by the Society.

William H. Spooner moved that a committee of three be appointed to consider and report what further regulations were necessary for the proper conduct of the exhibitions, and the preparation for and closing of the same, and especially to prevent the loss of articles exhibited. The motion was unanimously carried, and the Chair appointed as that Committee, William H. Spooner, Chairman of the Flower Committee, E. W. Wood, Chairman of the Fruit Committee, and C. N. Brackett, Chairman of the Vegetable Committee.

Robert Manning moved that a committee of three be appointed to consider what recognition should be made of the specimens of Lepidoptera shown by Ernest E. Fewkes at the Annual Exhibition. The motion was carried, and the Chair appointed as that Committee, George W. Humphrey, William H. Spooner, and E. W. Wood.

While the polls remained open, President Hayes spoke of the financial condition of the Society, congratulating the members on its improvement, and said that \$6,000 of the floating debt had been paid during the year, and \$3,000 would be paid in the present week, and it was hoped to pay \$3,000 before the end of the year, thus clearing off the entire floating debt of the Society. He believed that the income in future would enable it to increase the amount appropriated for premiums, and at the same time to lay up something every year towards extinguishing the mortgage debt.

Hon. Marshall P. Wilder referred to the efforts made to secure the present site and building of the Society, and congratulated the members that the President had consented to serve another year, and also on its prosperity as shown by the statement just made by the President. He had known the Society for fifty years, and it had never before been in so prosperous a condition.

Rev. A. B. Muzzey spoke of his long connection with the Society and of the interest now felt in it, and of the opportunities which it affords not only for the sight of beautiful flowers and fruits, but for instruction in horticulture. It owes much to the continuance of the lives of many of its older members, with enthusiasm like that of the veteran Ex-President Wilder, who had just spoken. But all institutions depend on their head, and the speaker wished to

render all honor to him who now presides so ably and successfully over the Society, with a heart full of love and zeal for the promotion of horticulture.

President Hayes thanked the members for the flattering manner in which the mention of his services had been received, and said that having aimed to do his duty during the time he had filled the office of President he had wished to retire; but had been induced to continue another year. The success of the Society depends on the practical workers among its members, who, week after week, exhibit their flowers and fruits and vegetables, and among these he wished to give due praise to the ladies, from whom the men might well take example. He also spoke of the great value of the Library and of the labors of the Library Committee and the Librarian, in securing and making accessible to the members the most valuable works on horticulture and its kindred sciences.

Mrs. H. L. T. Wolcott wanted to urge on all the members of the Society, old and new, the importance of utilizing to the fullest extent the valuable library of the Society, and of remembering that the Library Room, in which they were assembled, is full of instruction—not only practical works but scientific. She was reminded of its wide scope by the fact that a member of the Korean embassy found here illustrations of the plants of his own country, and of articles from thence, displayed in the Foreign Exhibition now open in this city.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

EDWARD K. BUTLER, of Jamaica Plain.

THOMAS F. GALVIN, of Boston.

MARSHALL M. TIDD, of Woburn.

WILLIAM ROBINSON, of North Easton.

SAMUEL C. B. ROGERS, of Boston.

JOHN R. BALLARD, of Dedham.

The polls were closed at five minutes past twelve o'clock, and the Committee to receive, assort, and count the votes reported through their Chairman that the whole number was fifty-six, and that all the persons whose names were on the ticket presented by the Nominating Committee, were chosen. The report was accepted and the persons named were, agreeably to the Constitution and

By-Laws, declared by the President to have a majority of votes, and to be elected Officers and Standing Committees of the Society for the year 1884.

Adjourned to Saturday, November 3.

BUSINESS MEETING.

SATURDAY, November 3, 1884.

An adjourned meeting of the Society was holden at 11 o'clock, Hon. FRANCIS B. HAYES, President, in the chair.

The President, as Chairman of the Executive Committee, reported a recommendation that the Society appropriate the following sums for the year 1884 :

| | |
|--|---------|
| For Prizes and Gratuities, | |
| For Plants and Flowers, | \$1,750 |
| “ Fruits, | 1,000 |
| “ Vegetables, | 550 |
| “ Gardens and Greenhouses, | 150 |
| For the Committee on the Library, for the purchase of magazines and newspapers, binding of books, continuing the card catalogue of plates, and incidental expenses of the Committee, | 400 |
| For the Committee on Publication and Discussion, | 150 |
| For the expenses of the Committee of Arrangements, | 300 |

Agreeably to the Constitution and By-Laws the Report was laid on the table until the first Saturday in January.

Adjourned to Saturday, December 1.

BUSINESS MEETING.

SATURDAY, December 1, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The Annual Report of the Committee on Plants and Flowers was read by William H. Spooner, Chairman.

The Annual Report of the Committee on Fruits was read by E. W. Wood, Chairman.

The Annual Report of the Committee on Vegetables was read by Charles N. Brackett, Chairman.

The Annual Report of the Committee on Publication and Discussion was read by Benjamin G. Smith, Chairman.

Robert Manning read his Annual Report as Secretary and Librarian.

These reports were severally accepted and referred to the Committee on Publication.

The Committee on the Library, the Committee on Gardens, and the Committee of Arrangements, asked further time to make their reports, which was granted.

William H. Spooner, from the Committee appointed at the meeting on the 6th of October to consider what recognition should be made of the collection of Lepidoptera, whose larvæ are injurious to vegetation, shown by Ernest E. Fewkes at the Annual Exhibition in September last, read a report with a unanimous recommendation that a First Class Certificate of Merit be awarded to the exhibitor. The report was accepted and the recommendation was adopted.

The President, as Chairman of the Executive Committee, presented the List of Prizes recommended by the Committee on Establishing Prizes to be offered for the year 1884, with the approval of the Executive Committee. Some amendments being suggested the report was laid on the table for one week, for further consideration.

Hon. Marshall P. Wilder, Chairman of the Committee on Large and Interesting Trees, reported that the Committee had gathered much interesting information on the subject, but, as it had proved larger than was anticipated, he moved that further time be granted to prepare for publication the material collected, and, also that John Robinson, Professor of Botany to the Society, be added to the Committee. Both these motions were carried.

Mr. Wilder also referred to the action of the American Pomological Society, at its recent session, in regard to improving and

simplifying the nomenclature of fruits, and read from his address as president of that society his views in relation to the subject. The following votes on the subject were passed :

Voted, That in all the exhibitions and publications of the Society, the nomenclature of fruits be conformed to that of the Catalogue of the American Pomological Society.

Voted, That exhibitors of fruits shall not be disqualified by using the present names at the exhibitions.

Edward L. Beard was added to the Committee on rules for the better conduct of the Society's exhibitions.

Benjamin G. Smith, Chairman of the Committee on Publication and Discussion, gave notice that the series of Meetings for Discussion the present season would commence on the next Saturday, with the reading of an essay by John J. Thomas, of Union Springs, N. Y., on "Live Hedges, for Protection and Ornament, and the Plants most suitable for them."

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society :

STILLMAN S. HOVEY, of Woburn.

ARTHUR HUNNEWELL, of Wellesley.

ALEXANDER GREENLAW, of Boston.

THOMAS W. DEE, of Mount Auburn.

Adjourned to Saturday, December 8.

BUSINESS MEETING.

SATURDAY, December 8, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The Annual Report of the Library Committee, was read by William E. Endicott, Chairman.

The Annual Report of the Garden Committee, was read by John G. Barker, Chairman.

These reports were severally accepted and referred to the Committee on Publication.

The Schedule of Prizes for 1884, laid on the table at the last meeting, for consideration today, was taken up. Several amendments were proposed and adopted, and the Schedule was then adopted.

The President stated that a communication had been received from the Worcester County Horticultural Society, asking the cooperation of this Society in a movement to secure the exemption of horticultural societies from taxation. The subject was referred to the Executive Committee.

Adjourned to Saturday, December 15.

MEETING FOR DISCUSSION.

HEDGE PLANTS AND HEDGES.

BY JOHN J. THOMAS, Union Springs, N. Y.

In answer to the question, "Are live hedges to be recommended; and, if so, what plants are most suitable?" the writer of this essay desires to report his experiments performed during the past forty years with hedges, both for farm use and for ornament, and with several different hedge plants. In giving the results of these experiments, and placing each sort in the position of its real value, it will be necessary to point out the kind of treatment to which each has been subjected, as some may be valuable with one kind of management, and useless with another.

The deciduous trees and shrubs on which the experiments were performed, were the Buckthorn, Osage Orange, Honey Locust, Privet, and Barberry. The evergreens were the Norway Spruce, Hemlock, and American Arbor Vitæ. The Osage Orange was more extensively planted than any other; long lines of this hedge on farms, commenced from twenty to twenty-five years ago, being still in good order, and affording efficient protection against farm animals.

The earliest experiments made by me forty years ago, were with the Buckthorn. It has the special advantages of great hardiness, a naturally thick and hedgy growth, and easy propagation by seed. The young plants, which have a copious mass of fine fibrous roots, are easily transplanted, and there need not be a failure to grow of one in ten thousand, if the work is performed with reasonable care. In order to keep the hedge thick and within bounds, a moderate

amount of cutting back is requisite. But with all its advantages the buckthorn has a serious drawback. The growth is not stout enough to resist unruly animals, unless growing in a richer soil than farms generally possess. The annual cutting back, although moderate, is an objection to farmers; and they have generally preferred the more costly post and board fence, with no yearly care.

The buckthorn hedges which I have made, have cost about twenty-five cents a rod the first year, including the preparation of a strip of mellow soil five feet wide, the purchase of the plants, the setting, and occasional horse-cultivation to keep two feet of clean soil on each side. The yearly cultivation afterwards, and the annual cutting back early in spring, until the hedge had reached full size, was not over three or four cents a rod.

Although the buckthorn has nearly passed out of use as a hedge plant, on account of its inefficiency and want of real thorns, it is by no means impossible that it may be again extensively planted in future years, when cultivators find that it may be converted into an efficient barrier by enclosing two or three barbed wires extending its length through the interior, these wires, supported on occasional posts, being successively placed in position as the hedge increases in height, the branches growing around the wires and holding them immovably in position (Fig. 1). Gal-

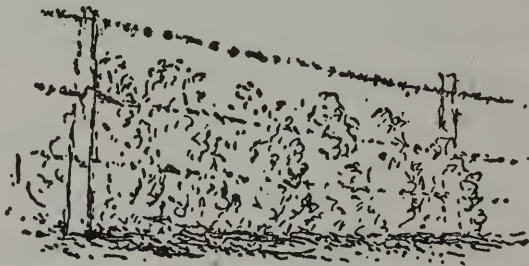


Fig. 1.

vanized wire should always be chosen on account of its durability, instead of painted wire, which is liable to be affected with rust in a few years.

I have planted many Osage Orange hedges, and given them different modes of treatment. They require more care in planting than the buckthorn, in the assorting of plants of equal size and vigor, and in the rejection of those of feeble vitality. If all are not of equal size, they should be assorted into at least two sizes, and those which are alike planted together. As with all other hedge plants, they should be set in a single line, double lines being more

difficult to keep clear of weeds and grass, while they possess no real advantage. About eight inches apart is a suitable distance to place them. The line of the hedge being a bed of fine mellow earth, they are carefully set with a stretched line. For the first few years the ground must be kept well cultivated.

As the Osage orange is partly tender, it will not endure the winters at the north, unless on well-drained soil. I have often had occasion to observe its healthy appearance on dry, gravelly knolls after severe winters, while in adjacent wet and rich depressions it had been nearly killed down to the ground. Hence the importance of placing a good tile-drain within a few feet and parallel with the hedge. Thus protected from a wet subsoil, I now have good hedges twenty-five years old, the cold of winter having often sunk the thermometer ten or twelve degrees below zero, and in rare instances lower.

No hedge is more commonly mismanaged than the Osage orange. It is planted in the first place in imperfectly prepared ground; vigorous and feeble plants mixed together are placed in the line; cultivation is neglected, and weeds and grass are allowed to choke the growth; it is not regularly cut down in successive years, and when the cutting is performed, it is not done low enough to give a thick and impenetrable mass of branches at the bottom. Hence the common appearance of broken and irregular lines, instead of perfect uniformity. Where more careful attention is given, the hedge is nearly spoiled by allowing too much breadth at the top, as shown in Fig. 2; the heavy shade above causing meagre growth

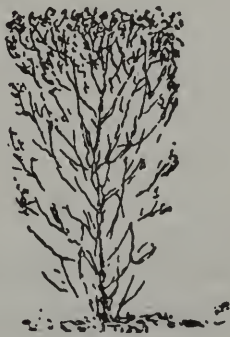


Fig. 2.

and openings below. A better form is represented in Fig. 3; but an objection still exists with many hedges pruned into this shape, in *shearing* to a uniform surface instead of cutting back more irregularly, as shown in Fig. 4. The shearing causes a very thick

and short growth of leaves at the exterior, excluding the light from the inside and causing bare branches in the interior. Cutting



Fig. 3.



Fig. 4.

back more irregularly with a knife allows the growth of interior foliage and gives more health to the hedge. The sheared hedge presents an unnatural stiffness on ornamental grounds; cut back with the knife, if the operation is skilfully performed, it has more of the beauty of natural form. This is a matter which should be well understood, as the value of any recommended hedge plant depends on its proper management, and the Osage orange, and other hedges, have been pronounced failures by those who have mismanaged them.

For coarse farm barriers, hedges do not necessarily require the elaborate care just described. Another mode of treatment has been adopted in the Western States. The trees are trimmed and the main stems trained upright for a few years. They are then cut half off at the ground, and bent over in one direction at an angle of about thirty degrees with the ground (Fig. 5), trees being left

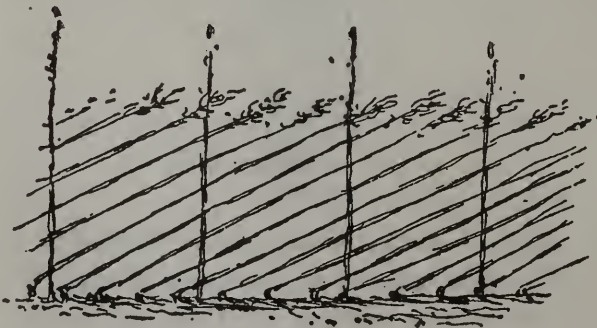


Fig. 5.

upright at distances of four or five feet, and the inclined ones are interwoven among them, a straight line of trees being thus formed. The tops are then all cut off about three feet high. New shoots spring up in abundance from the sides and stumps, and form an impenetrable growth. Sometimes as many as fifty limbs have been counted sprouting from a single tree the first year. The top of the hedge is cut back annually to within a few inches of its previous height. Hedges made in this way have no gaps.

Whenever a hedge becomes too high by long years of growth, it is well to adopt a similar but simpler mode of treatment, first partly trimming the trees with a light axe or hook with a long handle, then cutting them half off at the ground, and bending them over. A new growth will spring up and form a new hedge, as shown in Fig. 6. I have adopted this course with a hedge sixty rods long,



Fig. 6.

planted twenty-eight years ago on a distant tenant farm where personal attention could not be frequently given. It was set within eight feet of a parallel tile-drain, and it has been a perfect farm-barrier for more than twenty years.

The cost of the last described hedge, including the preparation of the ground, the price of the plants, the labor of planting, and the necessary horse-cultivation, was about twenty-five cents a rod the first year; and the three subsequent cuttings for the sixty rods cost about twenty dollars in labor, or, as an average, a little less than a dollar a year. But it was usually too tall, and it shaded and occupied too much ground to be recommended where land is valuable.

Ninety rods of Osage hedge, trained as represented by Fig. 3, cost about the same for planting, and for the first few years of cultivation, but more for annual cutting back. It was planted twenty-four years ago, and has been a barrier for about twenty years. The yearly cost of pruning, since it has reached full height, has been about four cents a rod for the first ten or twelve years, and of late

years, after it had become larger and higher, nearly double that sum. The cutting back was performed either with a stout hook having a handle two and a half feet long, or a short, stout scythe. Hedge-shears were too slow in their operation, and were adapted only to ornamental hedges; but even for these the knife was preferred, as already mentioned.

The Honey Locust has been extensively used for hedges of late years, being preferred on account of its hardiness. By selecting the seed from the most thorny trees, young plants are obtained well armed with thorns, and making very efficient hedges. The trees having a tall, slender, and not hedgy growth, require thorough cutting back to impart a thick mass of branches, and very few of the many honey locust hedges have been sufficiently cut back when young, to prevent openings at the bottom. Similar general treatment is to be given to the honey locust, in planting and rearing, as to the Osage orange.

Many hedges have been greatly injured by pruning after the summer growth had commenced, and sometimes the young plants have been thus fatally checked. But the fact is becoming better known that the pruning must be done in spring, before the buds swell, if vigorous growth is to be preserved. The only exception to this rule is with strong growing hedges that are likely to become too tall unless some check is given after they have reached full height, and this check is easily furnished by summer pruning.

Although the cost of planting and starting hedges is less than that of building a good board fence, as has been already shown, it must be admitted that they are not adapted to the management of ordinary farmers, who cannot be induced to give them the perfect and continual attention required to keep them in good order. This conclusion is fully sustained by observing how few have succeeded with hedges, and how many have allowed them to be ruined by neglect.

The evergreens which have been employed have been exclusively for ornamental screens and not for farm barriers. The Norway Spruce may be placed at the head of the list, on account of its rigid growth, hardiness, and the freedom with which it may be cut back. It will bear more shade than many other evergreens, and hence the interior of the screen is green with foliage. The cutting should be done with a knife and not with shears, for the reason already stated. Next to the Norway spruce is the Hemlock, which

exceeds the former in its lively green color in winter, while it is unexcelled in retaining interior foliage. It will bear pruning or cutting back to an almost unlimited extent, if the work is done in spring before growth commences. But it is not so stiff as the Norway spruce as a barrier. The American Arbor Vitæ, although much used, becomes destitute of foliage inside, and is browned by winter.

By the introduction of barbed wire an important change is likely to take place in planting hedges. Barb-wire makes a cheaper fence for its efficiency than any other material. A serious objection to it is the danger of animals being lacerated against the barbs before they are aware of its presence, the wire being nearly invisible. This objection may be obviated by enclosing the wires within a visible hedge. Another important advantage is the efficiency which may be thus imparted to small-growing hedge plants, as the Privet, Barberry, and small evergreens. These small growers will require but little labor in cutting or shearing, compared with that required for such large ones as the honey locust and Norway spruce. After being once established, such hedges would become handsome ornaments. The Purple Barberry, for example, would present an attractive appearance during a large portion of the year. A new value may be thus given to hedges, by rendering the moderate growers, and those easily kept in shape, efficient barriers for farms and fruit gardens.

DISCUSSION.

J. W. Manning said he was convinced that the Osage orange will not make a practical hedge here, or north of Boston, though he had seen good ones in Connecticut. It soon becomes deformed by winter-killing. The Norway spruce is too heavy for a hedge in some positions. The American arbor vitæ is most practical; a hedge of it can be repaired, if injured, better than spruce. It is a great mistake to prune any evergreen hedge too close; instead of being closely sheared for years, it should be headed back less formally, and allowed to expand from bottom to top to remain healthy. If planted too close they are not so long-lived as when they have more room. Arbor vitæ should not be less than two feet apart and Norway spruces not less than three or four feet.

Benjamin P. Ware said that fifty years ago he assisted in setting a hedge of honey locust, which grew very vigorously and

was difficult to keep within proper limits. It was neglected, and some of the plants grew more vigorously than the others and now form a row of beautiful trees; many of which, however, are very near together, as they were planted only two feet apart. Some of the trees have no thorns. The land within forty feet of these trees is of little value; no corn of any account will grow there. A buckthorn hedge planted thirty years ago is now vigorous and beautiful but requires a great deal of pruning. The branches gain about an inch in length every year; if cut closer, the thorns will be removed. It is thoroughly hardy; no insect preys upon it, and cattle will not browse it. The berries are an excellent purgative, as is indicated by the scientific name, *Rhamnus catharticus*. Half a dozen berries make a good dose, acting promptly, and having no objectionable quality.

Edmund Hersey recommended the Red Cedar on the Atlantic coast. It is very hardy, will grow on any soil, bears trimming well, and with the aid of wires makes a good fence. It is seldom winter-killed, and is very desirable for a screen—better than many others. It thrives on the very bluffs of the ocean and is not injured by the spray.

Mr. Ware thought the red cedar difficult to transplant, and of slow growth. He had tried to grow it from the seed, and thought it would be desirable if this could be done.

Mr. Hersey said that he had never sown the seed, but the seedlings spring up in great numbers wherever there are old trees, and small trees are easily transplanted, and if taken up with a sod are very sure to live. He set a row on the south side of a board fence, where there was only gravel for them to grow in, and, though they were not watered, ninety-five per cent lived. They were not over a foot in height when set.

John B. Moore thought a hedge as a barrier a perfect nuisance, and moreover it is costly and harbors vermin. A wind-break is another matter. The Norway spruce or White Pine is best for this purpose, and should be allowed to grow as nature intended, but a strip of land two or three rods in width on each side must be sacrificed to it. If it is intended as a shelter for buildings it should not be placed too close to them, but several rods away, especially if of white pine. If landscape beauty is wanted, it is better not to have any fence, but to plant groves and groups of trees.

Leander Wetherell said that Mr. Moore had expressed his views; hedges are costly and incommo-
dious as barriers here. They sucker

and breed and harbor vermin. For decoration and shelter they are going out of use. In Illinois, Osage orange hedges have been extensively planted, and Professor Turner told him that a wild steer could not go through one, but land is plenty and timber scarce there. The Osage orange has fruited in Connecticut, and a friend of the speaker had planted a hedge of it, but the soil here is not generally good enough, and he knew no good reason for its cultivation.

Benjamin G. Smith said that the *Pirus Japonica* makes a very beautiful hedge where one is desired for ornament. There are several in view from his residence. They are of slow growth, beautiful both in foliage and flower, and very desirable.

Joseph H. Woodford thought hedges desirable as screens in village gardens. The trouble with many buckthorn hedges is that they are cut square, with the sides perpendicular and the top horizontal, and under such treatment the lower branches are sure to die. He knew such an one which was headed down and, when it grew up anew, was trimmed in wedge shape, and is now most beautiful, with foliage to the ground. It is the same with Norway spruce hedges; the lower branches must be kept longest.

John G. Barker said that when Edward S. Rand, Jr. planted his grounds in Dedham, he desired to separate one part from another, and the question what to plant for a screen came up. It was finally decided to try the *Pirus Japonica*, and a hedge seventy-five feet long was planted, and proved all that was desired. The speaker had seen it in several places, and always beautiful. He has been for eleven years laboring to get the hedges away from around the small lots in Pine Grove Cemetery, at Lynn, of which he is superintendent. In planting a hedge or screen, the neighboring objects should always be carefully considered. He was consulted in regard to a hedge around St. Stephen's Memorial Church, in Lynn, a low walled building, around which it was proposed to plant a screen of Norway spruces, that would have hidden and dwarfed the building. At the Botanic Garden, in Cambridge, a screen was wanted to shut off the potting ground, and *Forsythia viridissima* was planted, which answered well, as long as it was cared for. He had seen at William C. Harding's, *Deutzia scabra* used as a screen, and *D. gracilis* planted along the top of a bank against a wall, forming a miniature hedge and giving an ornamental finish to the barrier.

Mr. Manning said that the California Privet, *Ligustrum myrtifolium* is being extensively planted for hedges along the shore at Newport, R. I. The foliage is larger than that of the English or American Privet, and remains green until zero weather. It is easily propagated by cuttings, which should be taken up in autumn and sheltered over winter, after which it is quite hardy. He has cultivated it for a dozen years; if unpruned it will grow twenty feet high. All hedges should be pruned in wedge shape. The white pine makes one of the best screens, and the Balsam Fir is good. He had heard no complaint of the Norway spruce for this purpose, except that it grows too large. When a strong wind-break is required, he would plant a variety of evergreens, and a double row is better than a single one. They should be ten feet apart where the land can be spared. The hemlock is the finest of all evergreens, but does not succeed equally well in all localities. He had a hedge of it injured by the winter, but renewed it. Arbor vitæ hedges running east and west are more likely to be injured than those running north and south, as is proved in his grounds. In 1863 he planted a hedge of arbor vitæ, seven or eight feet high, and lost only three out of several hundred. It is now twelve feet high, and spreads five feet. If he had pruned it close it would have been killed out in some places before now. *Spiræa Thunbergii* bears pruning well and makes a neat hedge.

William D. Philbrick said that the red cedar can be propagated by cuttings, on the cutting-bench in the greenhouse. Evergreens are injured by drought; the arbor vitæ has suffered much, and hemlocks somewhat, but Norway spruces less.

President Hayes said that he had planted an arbor vitæ screen, which had done very well. He had also a hemlock hedge which he thought very beautiful, and was astonished to see it, as he supposed, almost all winter-killed, so that he believed he should have to cut it down, but is now agreeably disappointed in finding three-quarters of it alive. He thought the *Pirus Japonica* very desirable for hedges. As a farmer, he would not have hedges; as a horticulturist, he would plant them for ornament and shelter.

Mr. Manning said that the *Crataegus pyracantha* (evergreen thorn), makes a magnificent hedge, with showy orange berries, but was winter-killed last winter. He thought that there had been a great change in public opinion, in regard to hedges, and that much fewer are planted now than formerly, but more evergreen trees are

planted for wind-breaks. Almost any evergreen tree, however large, will live, if you can get a ball of earth with it, or if it has been provided with a mass of fibres by frequent transplanting; but no rule applies in all cases. Evergreens must not dry between digging and planting. Of seven hundred prostrate junipers which he planted without balls, nearly all lived, but care was taken not to expose them to sun and air.

Notice was given that on the next Saturday, William D. Philbrick would read a Prize Essay, on "The Best Method of Constructing and Heating a Greenhouse for Amateur Use."

BUSINESS MEETING.

SATURDAY, December 15, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

William H. Spooner, Chairman of the Committee appointed October 6, to consider what further regulations were necessary for the better conduct of the exhibitions, and the preparation for, and closing of the same, presented the following report:

1. During the preparations for all prize exhibitions, a door-keeper shall be stationed at the door of the Hall, who shall on no account leave his position, and shall see that no person, except Members of Committees, and Exhibitors or their assistants, is admitted to the Hall, upon any pretext whatever.

2. At the close of every exhibition, a door-keeper shall be stationed at the door of the Hall, who shall on no account leave his position, and shall, on no pretext whatever, admit any person to the Hall except Members of Committees, and Exhibitors or those bearing written orders from them for the delivery of articles exhibited, and all other persons who may be in the Hall at the close of the exhibition shall leave immediately.

3. In the case of exhibitions continuing through the evening, no articles shall be removed until the next day, at such time as the Committee of Arrangements shall appoint; and the members of that Committee shall be present at such time, and shall attend to the delivery of articles exhibited.

4. The Superintendent of the Building shall employ all assistance necessary to strictly enforce the above rules, including police.

5. Exhibitors disposing of any of their exhibits *must* notify the Superintendent of such disposal, and the Superintendent shall not deliver such articles without a written order from the *owner* thereof.

The strictest rules, enforced in the most faithful manner, will, without the coöperation of the members of the Society, fail of full effect, and an earnest appeal is made to every member to set the example of strict compliance with the rules, even at the expense of slight temporary inconvenience, for the sake of the ultimate benefit to the exhibitions and the Society. Past experience of growing abuses has shown that such rules are absolutely necessary. If any exception is made in favor of any member, the next comer will claim an exception in his case, and the enforcement of the rules is at an end.

WILLIAM H. SPOONER,

Chairman of Committee.

The report was unanimously accepted, and the rules were adopted, and ordered to be printed.

Adjourned to Saturday, December 22.

MEETING FOR DISCUSSION.

THE BEST METHOD OF CONSTRUCTING AND HEATING A GREENHOUSE, FOR AMATEUR USE, TAKING ECONOMY AND EFFICIENCY INTO ACCOUNT.

By WILLIAM D. PHILBRICK, Newton Centre.

The average amateur, for whom we are to construct a greenhouse, will wish to keep a considerable variety of flowering plants, and also some stock of bedding plants, to be used in the garden in summer; he will take delight in propagating his own stock, and will therefore need a cutting-bench; some of the plants he will want are tropical, others are more or less hardy; some delight in abundant sunshine, others flourish better in partial shade or in the diffused light of a house facing northward.

To satisfy these various demands of the different plants to be raised, a span-roof offers at once the most efficient and attractive

plan; its south side will suit the flowering plants that love the sunlight, while its northern side will be the place for the delicate ferns, the camellias, and the cutting-bench. There will be no unsightly north wall as in the "lean-to" house, and by bending the rafters or sash bars, we can give it quite an ornamental appearance.

It should be partitioned off into at least three or four compartments. Two of these will face the sun and will be used, the one for hardy, the other for tropical plants, which love the sun and air, such as most flowering plants and bedding stock. The tropical plants will need a temperature of 60° at night, while the hardy ones will do far better in a temperature of 40° or 45° at night. They will both need abundant airing on sunny days and must therefore be provided with ample ventilators. The portion of the house facing north should be divided from the portion facing south, by a partition, for the plants which flourish in the diffused light also need little ventilation, and would suffer if exposed to the dry heat of the south side at mid-day.

We shall have then a span-roofed house, say twenty feet wide, and as long as the needs and the means of the owner require. The south side should have upright sashes for ventilation, three feet high from the ground; from the plate to which these sashes are hung spring the sash bars, of pine, two by one and three-eighths inches, rising to a ridge nine feet high, eleven and a half feet horizontally from the front of the house, and giving a length to the rafters of about thirteen and a half feet. The north side of the house will be eight feet wide, with rafters ten feet long springing from a sill laid upon a concrete wall three feet high. This plan gives a steeper pitch to the north side, so as to prevent snow from lodging, and will probably be found wide enough for the wants of most amateurs. The glass should be double thick, ten by twelve inches, bedded in putty and well painted over the putty. Ventilating sashes, three feet square, will be needed every six feet along the ridge-pole on both sides. A row of posts at each side of the path, running lengthwise of the house, and carrying a purline, will give sufficient support.

The compartment nearest the fire on the south side will be used for tropical plants, and the one directly behind it on the north side for the cutting-bench; beyond these and separated from them by a cross partition will be, on the south side, the place for hardy flow-

ering plants, and on the north side the place for ferns, camellias, smilax, etc.

The cutting-bench is best made of slate stone, supported on brickwork and heated by hot water pipes directly under it, and provided with valves for regulating the heat. The glass over the cutting-bench should be provided with curtains of white sheeting, to shade the delicate cuttings from the sunlight.

The heating apparatus best suited to the wants of the amateur, is the ordinary hot water circulation from a boiler placed about four feet below the level of the house floor, in a well-drained cellar, at one end of the glass, and covered by a shed or office, which, being always warm, will be found a convenient workshop in cold weather. In providing a boiler, always get one a size larger than the pipe-fitters advise, for it is a very bad thing to find your heating apparatus insufficient. Very much, however, depends upon having a good draft to the chimney; the same boiler will do twice the work with a good draft that can be done with a low and small chimney.

To maintain a tropical heat in the compartment which we have supposed to be eleven and a half feet wide, and nine feet high, will require six or eight four-inch pipes, while the portion devoted to hardy plants will not need more than half as many. In heating a house, very much will depend upon its location and the shelter afforded by the surrounding hills and trees on the north and west.

The compartments on the north side will require about four pipes to heat them enough; in the portion devoted to the cutting-bench two of these will pass under the bench and will be enclosed in brickwork, so as to give bottom heat to the cuttings.

Almost as important as the heating apparatus, is an abundant supply of water. If it cannot be had from the public works, a good dependence is a windmill, with an elevated tank fifteen or twenty feet high in the loft of the boiler house. It is desirable to have the water slightly warmed for tropical plants, and this may be easily effected by having the tank connected with the hot water boiler by circulating pipes provided with valves. The only objection to this arrangement is that it places the whole circulation under pressure of the tank while heating, which is no objection if the joints are good.

This plan may be modified, if found convenient, by placing the boiler with its shed in the middle of the structure, carrying the

heating pipes both ways therefrom. This arrangement has the advantage that the circulation pipes will not extend so far from the boiler; this, however, is not a matter of great importance, and the location of the boiler will be governed in great measure by considerations of convenience as regards accessibility by the coal wagon, drainage of the cellar in which it is placed, and nearness to the supply of water. In the illustrations, the boiler is represented as being at the end of the structure; if in the middle, it would have a rather more symmetrical appearance.

If the water-tank is placed directly over the boiler, as represented in the illustrations, the waste heat from the boiler and chimney will effectually protect it from freezing, without any heating pipes for warming the water. This arrangement will suffice for watering hardy plants, but when watering very tender tropical plants the water needs warming.

The internal arrangements of the house will of course be best left to the taste of the owner and his wife; it will only be needful here to suggest that any plant will thrive far better planted in a bed where its roots can spread, than confined in a pot, but the confined condition of the roots favors early flowering. Moreover, plants that are to be removed to the open air in summer, are best potted. The pot, therefore, is a necessity, and it is best kept from drying up by plunging it to its rim in clean sand.

Such a house as we have described will cost from fifteen to twenty-five dollars per foot of length, according to the style and thoroughness of the work.

Many amateurs will not care for so expensive an arrangement, but will be content to have a small greenery of one apartment, attached to the dwelling house, and heated by a coil of pipe from the furnace in the cellar, or, where steam is used, by a steam pipe. There is a great deal of enjoyment to be had cheaply in this way, but it will hardly be necessary to give details, which must vary with the conditions of every case. The greenery must, however, be partitioned from the house so tightly that it can be smoked, without at the same time smoking the dwelling. A very convenient greenery may be cheaply made by fitting movable sashes between the posts of a piazza, to be moved in summer with all the furniture of shelves and pots. It may be heated by the furnace in the cellar; for this purpose it will suffice to place a heating coil of one-inch pipe, or a water-back, in the fire-pot of the com-

mon furnace, connected with a system of circulation around the piazza floor; or if steam is used for heating the house it will be very convenient to extend it to the greenery.

For small greenhouses detached from the dwelling house, the hot water circulation will be found cheaper and more satisfactory than steam, and far better than the old fashioned flue, red-hot at one end and cold at the other. Steam has its advantages where several houses are to be heated from one fire, since it is easier to divide and regulate the heat than with hot water circulation; but for heating so simple a structure as we have described above, there is probably nothing so efficient and economical as a good hot water boiler. The combination of flue and boiler is not of much practical importance, the amount of saving in fuel being balanced by the annoyance of impaired draft, and the danger from poisonous gases escaping into the house to the destruction of its contents. The flue is also a cumbrous affair and is now little used.

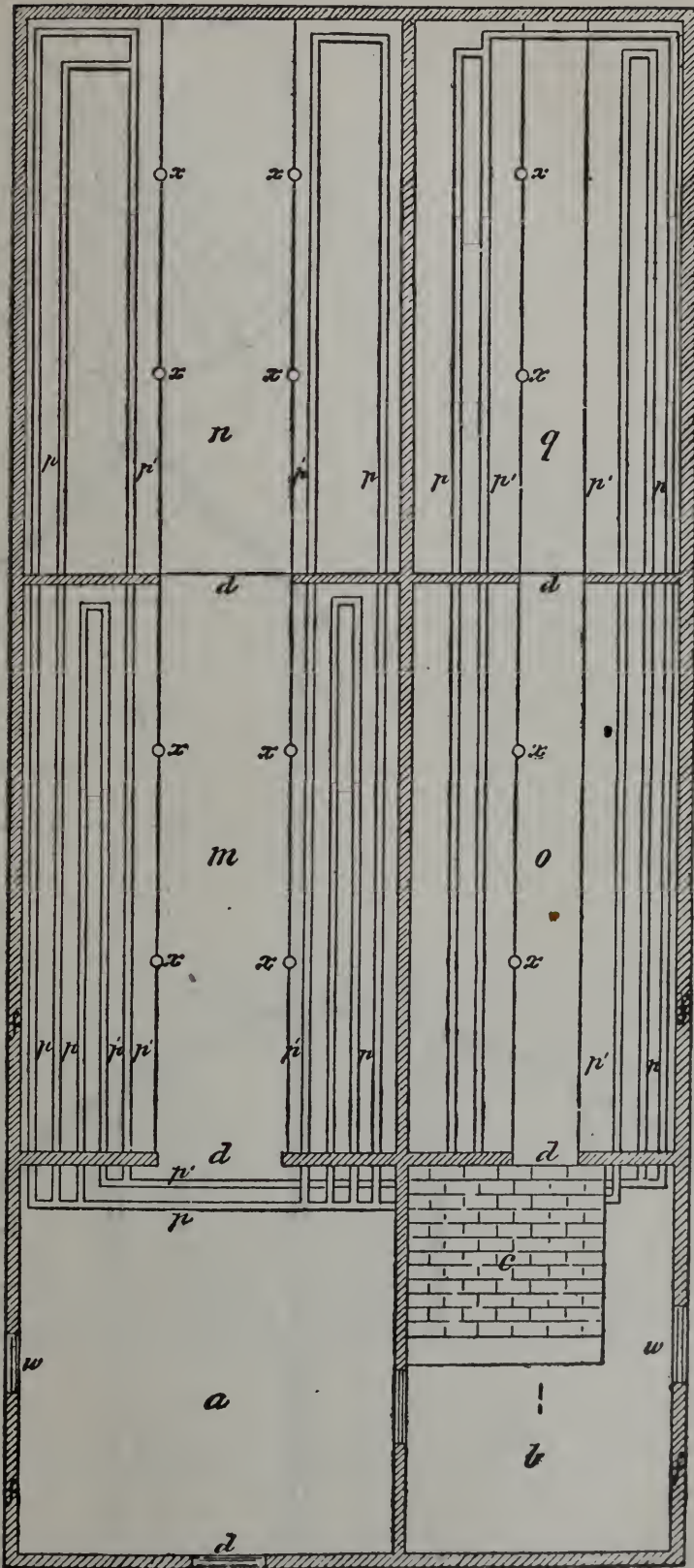
REFERENCES TO ILLUSTRATIONS.

Scale $\frac{1}{8}$ inch to 1 foot.

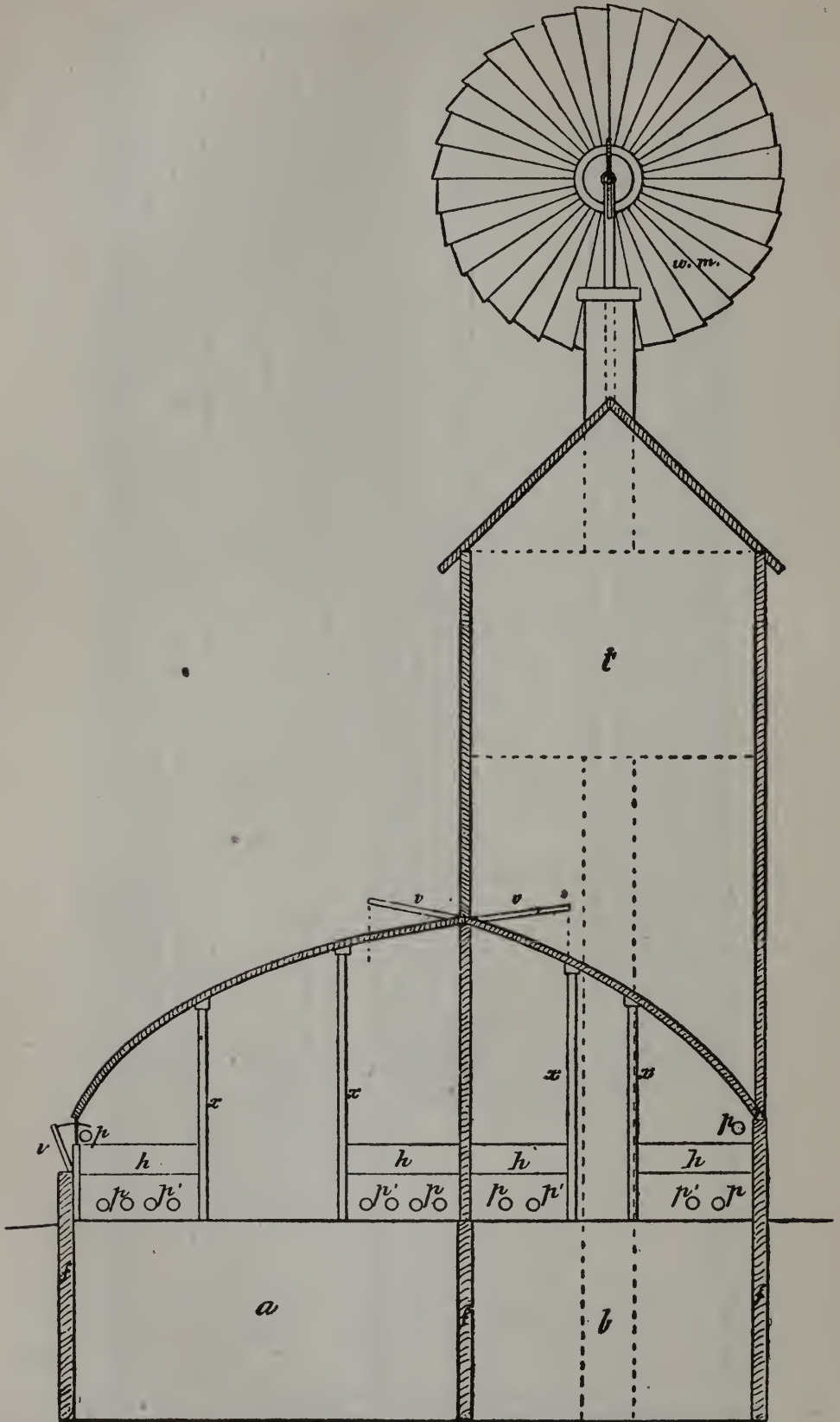
- m.* APARTMENT FOR TROPICAL PLANTS.
- n.* " " HARDY "
- o.* CUTTING BENCH.
- q.* CAMELIAS AND FERNS.
- a.* COAL CELLAR.
- b.* BOILER CELLAR.
- c.* BOILER.
- d.* DOORS.
- f.* FOUNDATION WALLS.
- h.* BENCHES FOR PLANTS.
- h'.* CUTTING BENCH.
- p.* FLOW PIPES.
- p'.* RETURN PIPES.
- t.* TANK.
- v.* VENTILATOR SASHES.
- w.* WINDOWS.
- x.* POSTS.
- w. m.* WINDMILL.

DISCUSSION.

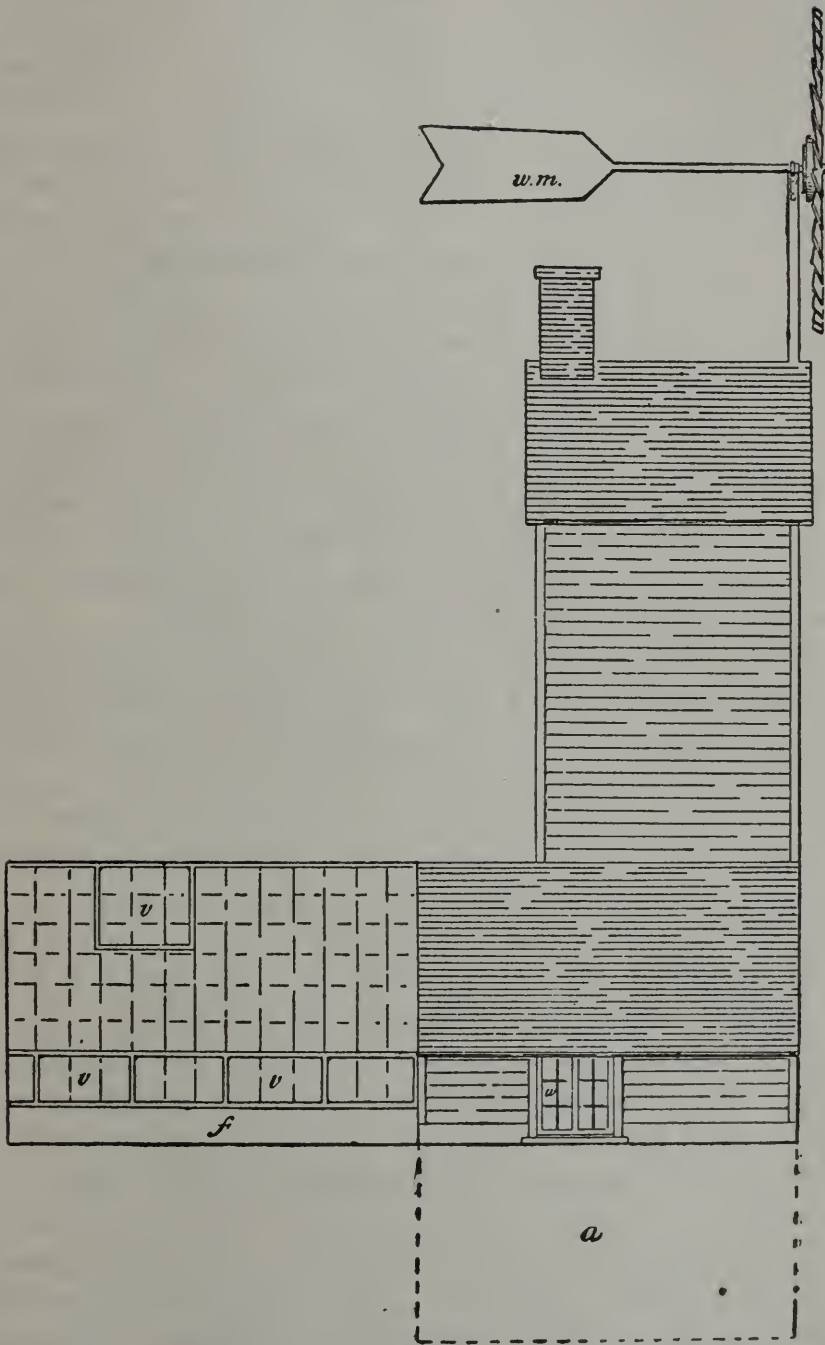
John G. Barker gave an account of the greenhouses at Pine Grove Cemetery, Lynn, of which he is superintendent. They are different from those considered by the essayist, as it was necessary to adapt them to the location. A plan was proposed by an architect, for which the means at command were insufficient, and the



PLAN OF GREENHOUSE FOR AMATEUR.



SECTION OF GREENHOUSE FOR AMATEUR.



FRONT VIEW OF PART OF GREENHOUSE FOR AMATEUR.

houses proposed were too large and not adapted to the situation. The place selected was a hill-side which it was desired to utilize. It was decided that a lean-to house was most eligible, and the front and back walls were constructed of split stone, found on the place. The house is fifty feet long, by fourteen feet wide, and eight and a half feet high. It has a fixed roof with a pitch of forty degrees, and is glazed with second quality double thick German glass, twelve inches by sixteen. The ventilators are two and a half feet square, and two feet apart. There is a bench on the front side, three and a half feet wide, under which cannas, abutilons, etc., are stored. The walk is two and a half feet wide. The house is used mainly for propagating coleuses and other bedding plants for summer decoration, and also plants for filling a large number of vases. Attached to it is a work-room, ten feet long, with a skylight in the roof. The house is heated by a brick flue, the face of the furnace being in the potting-shed, so as to keep smoke and coal gas out of the house, and the coal bin is opposite the furnace. The appropriation for building it was \$1,000, and though it was thoroughly built, \$28 was left when it was completed.

Another house was wanted, and it was placed directly in front of the first, and was built a little larger, with only sufficient slope of roof to throw off the water, being fifty-seven feet long, fourteen and a half feet wide, and eight feet high. It is used for pelargoniums, aloes, palms, etc., and the palms never suffer from dampness. The roof is all sashes, three feet by six, the lower row being fixed and the others movable. This gives excellent ventilation when the weather becomes warm in spring. A cement walk runs the length of the house, with a bench in front. Four feet from the back wall, a brick wall was built, and filled in with soil, in which aloes and other plants are set, which saves the trouble of potting. The remainder of the house has a gravel floor, on which plants in large tubs are set. This house, also, is warmed with a hot-air flue, and the same coal-bin serves for both houses. Mr. Barker believes in keeping in all the heat, and has seldom had occasion to make up more fire after dark. He burnt ten tons of coal in both houses last winter. Both houses work exceedingly well, but in large houses a flue would not answer. The houses will take in pretty tall plants, and he has tried to utilize all the room. The appropriation for the second house was \$600, and was not exceeded. The estimate of an architect for houses to

afford equal accommodation with these was \$5,500. The speaker thought that mistakes were often made in building houses too high.

President Hayes gave an account of his experience in building plant houses; the first being a conservatory attached to the rear of his city residence, which was planned by an architect, who estimated the cost at a thousand, or possibly twelve hundred, dollars. It was soon found that it would cost more, and the next estimate was \$1,800, and next it was thought that with some improvements it might be built for \$2,500. Then the war broke out, and the architect was elected an officer and went to the war, and when the conservatory was finished, the bills amounted to \$6,000. With this experience, when he wanted a conservatory at his summer residence in Lexington, he determined to employ men who understood their business, and accordingly Messrs. Lord & Brigham, of Irvington-on-Hudson, N. Y., who make a business of constructing plant houses, furnished plans and estimates for a house about eighty by forty-five feet, and quite high, and the expense did not exceed the estimates. He wanted rather a cool house for azaleas, palms, etc., including a collection of camellias which he had procured from Ex-President Wilder and others, and it has worked very well, and he could recommend the builders. The conservatory has a grapery and rose house attached, which are heated by a small boiler.

William C. Strong thought the President's recommendation of greenhouse architects a wise one, but it would be still better for practical cultivators to study the subject and go by their own common sense. He agreed with the essayist that there are positions where flues will answer, but generally hot water is best. Possibly, for large establishments, steam may be more controllable, and more economical, though the last point is doubtful. Steam requires more attention; it must have a man to watch it night and day. The speaker could perceive no difference in the atmosphere between hot water and steam. Perhaps steam will give more heat in very cold weather, but plants may not grow as well in the immediate vicinity of the pipes. Cast-iron boilers are extravagantly high priced, and do not economize heat as well as wrought iron tubular boilers. Second-hand tubular steam boilers, of sufficient strength for hot water, can often be purchased at very moderate prices. He has one for which, with all the appliances, he paid \$100, and which will do the work of four of the largest sized cast iron boilers, costing \$250 each, and will stand for a dozen years with hot water.

He had been much interested in the experiments in the use of vaporized petroleum for burning under common boilers. The inventor said that a boiler sufficient to heat ten acres was entirely practicable. It gives intense heat, and is used at the Norway Iron Works, in South Boston, for melting iron. He had no doubt of the advantage of hill-side greenhouses; the heat of the sun is a material factor in carrying one through the night.

Hon. Marshall P. Wilder preferred the atmosphere of hot water to that of steam. He has a hot water apparatus with copper pipes, put in forty-five years ago. The boiler has to be renewed once in eight years.

Mr. Philbrick compared the cost of heating by flues as recommended by Mr. Barker with that of heating with hot water. Mr. Barker's two houses have an area of 1,526 square feet, and he burns ten tons of coal. In his own lettuce house, with more than three times that area, he burns about fifteen tons—never more than eighteen.

Mr. Barker asked whether Mr. Philbrick began heating his lettuce house as early as he did his plant houses.

Mr. Philbrick replied that he heated his house for about six months, or whenever needed from October to May.

Col. Henry W. Wilson said that he had studied the subject under discussion for twenty years, and had had a good deal of experience in building plant houses. People study for a tasteful structure, when the first thing they should consider is the location, and, second, what plants are to be grown, and construct the house accordingly. Roses and smilax will not succeed in the same house. In 1868 the speaker built a small hot-bed, and the next year put on a monitor roof, and in 1870 he built a pit and heated it with hot water. The next year he put on an **L**, and raised ferns and smilax, cutting from two to three hundred yards of smilax at once. This went for two years, when he extended eighty feet in one direction and fifty in another, giving the plan the shape of a Gothic **F**. He had six or seven hundred pots of pinks, some dozens each of callas, camellias, azaleas, etc., giving him all the flowers he wanted for himself and his friends, and the sales paid all expenses. There is generally difficulty in getting uniform distribution of the heat; but he had his furnace in the centre of the house, and sunk so as to give a good circulation, and the thermometers at opposite ends never varied. By suitable arrangements of the pipes and

valves, the amount of heating surface could be increased or diminished at the instant, and thus the temperature of the house could be raised more speedily than by depending solely upon the firing, and could be lowered more safely at times than by the admission of outside air. There were, in effect, three distinct methods of circulation of the water.

He had 2,500 square feet of glass, and never used above ten tons of coal in a winter. Heat is applied to greenhouses to make good the loss by radiation; and as much of this loss as can be should be prevented. Nearly all greenhouses are built above ground, but he put the walls of his below the ground, and used burnettized lumber for the sake of durability, and also because it is free from the mosses and fungi which grow on wood when not thus prepared. The walls above ground consisted of posts boarded and covered with tarred paper and clapboards. He would not use second quality glass, because it has lens-like imperfections, which are liable to burn the plants, and the first quality costs but little more. He used glass ten inches by forty, which gives fewer joints, and is cleaner and therefore better, and, if double thick, will stand most hailstorms. Hard pine is better for rafters than burnettized spruce, because, though the latter is more durable, it does not in burnettizing lose its propensity to twist. He put in mechanical ventilators, and knew they were secure; they are the best arrangement where they can be afforded. The house was demolished by a tornado in 1879, and was not rebuilt.

He had in his house eight or nine grape vines, which gave him two hundred pounds of fruit annually. The whole was taken care of by one man, and he could recommend the same general plan to others. He was troubled about propagating plants, but carried a branch from a hot water pipe under the propagating bench, with a valve to regulate the heat, and then had perfect conditions for proagating—bottom heat, and cool air on top. Houses for propagating should be made very low, and are better if sunk in the ground, with the young plants near the top.

The best means of imparting heat is that which affords the desired temperature from the lowest temperature of the heating surface. Hot water pipes may be at a temperature of 180°, while steam pipes cannot be less than 212°, and with a pressure of three or four pounds to the square inch, will be 220°. Another great advantage of hot water pipes is their conservative quality, pre-

venting sudden fluctuations of heat, there being nine hundred gallons of water in the same number of feet of four-inch pipes, while there would be only two quarts of water in the steam which would fill the same pipes and afford the same heat. There are two reasons which have hitherto led to the choice of hot water in preference to steam as a means of heating plant houses,—first, that the extreme dry heat of steam pipes is a source of discomfort to animal life, and must be equally unfavorable to the tissues of tender plants; second, the latent heat of the water gives it a sort of conservative quality, whereby frequent or violent fluctuations of temperature are avoided when it is not possible to give constant attention through the night.

Mr. Wilder said that he used second quality glass, and picked out the best, but could not avoid some imperfections, which are liable to burn the foliage of plants. Instead of whitewash to prevent burning he uses mutton tallow, melted and applied with a sponge, as thinly as possible, on a warm day. It does not discolor the glass to any extent.

Joseph H. Woodford said that a year ago he visited several establishments with a view of finding the best boiler for running an engine. He visited the Norway Iron Works, where petroleum vapor has been substituted for coal. He believed that this fuel will find its way to greenhouses as soon as boilers small enough can be supplied. At present the demand for large boilers is so great as to give the makers enough to do without making small ones. A barrel of oil, costing three or four dollars, would last a great while for heating a greenhouse. He had lately visited Edmund Wood & Co.'s greenhouses at Natick, where he saw ten thousand Maréchal Niel roses ready to cut, and large quantities of Baroness Rothschilds and Gen. Jacqueminots, besides other flowers and ferns in great variety. The whole establishment is heated by steam from a sixty horse-power Babcock & Wilcox boiler, with the best results he ever saw. The fuel used is peat, just as dug from the bog and mixed with one-third anthracite coal dust, which heated to perfection. The makers of these boilers have in a year and a half put in three million dollars' worth of them. They burn everything—cotton refuse, etc., with the natural draft. The first cost may be a little more than that of other boilers, but it would soon be saved by those who have a deposit of peat, of which there are great quantities near Boston.

Notice was given that the subject for discussion on the next Saturday, would be "Carnations, Pansies, and Violets."

BUSINESS MEETING.

SATURDAY, December 22, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

The Annual Report of the Committee of Arrangements was read by the Secretary, accepted, and referred to the Committee on Publication.

The President, as Chairman of the Executive Committee, to whom a communication from the Worcester County Horticultural Society, in regard to the exemption of horticultural societies from taxation was referred, reported that the Committee were unanimously in favor of coöperating in the effort to secure such exemption, and had appointed a Sub-Committee to confer with the Worcester Society on the subject.

The President also reported that the Executive Committee had unanimously re-appointed George W. Fowle, Treasurer of the Society and Superintendent of the Building, and Robert Manning, Secretary and Librarian, for the year 1884.

Adjourned to Saturday, December 29.

MEETING FOR DISCUSSION.

CARNATIONS AND PANSIES.

C. M. Atkinson, who had been appointed to open the discussion, spoke first of the pansy, and described the properties of a perfect flower. Form is the most essential point, and includes not only shape but smoothness of margin and perfect flatness of petals, which must be so disposed as to form a perfect circle. Indeed, when the lower and two upper petals are removed, the two side petals will in first-class flowers meet at the upper and lower parts; for the petals to meet well above the eye, thus making the form of

the shield complete, is of the utmost importance. A disposition to bloom flat is also desirable, and the contrast between a rough, uneven, frilled flower, and one which, without artificial means, will dispose of its petals evenly and smoothly, exhibiting its rotundity in all its perfection, will immediately fix the attention and catch the eye of the veriest tyro. Saw tothing is another defect, and sometimes occurs in flowers otherwise unexceptionable, and even though minute, it tells against them. Indentation of the lower lip often occurs in otherwise good flowers, and destroys their rotundity, which is absolutely essential.

The second point is substance of petal. Whatever may be the excellence of form, if the flower be flimsy and weak, its beauty is destroyed. The petals should be thick and velvety, thereby enabling the flower to stand well. On the third point, harmony or a proper distribution of color, there has always been much diversity of opinion, but the best judges hold it absolutely essential that the three bottom petals agree in shade, whatever be the color of the upper ones; and in selfs it is necessary that they should all assimilate. No flower with the ground color stained can be admitted as first-class; it is as great a defect in a pansy as a discolored bottom to the cup of a tulip. Whether it be a white, yellow, or any other colored self, it must be pure and steadfast, and the eye large and well defined; and the more the latter contrasts with the body color the better. If the color be black, crimson, maroon, or purple, the eye must be white or yellow, with no shading off. In belted flowers, or those with a margin of color encircling the three bottom petals, it ought to be of a uniform width throughout, and in a perfect flower of this class no triangular spot is seen. Size is the least of all the essential requisites to a good flower; in either a single flower or a collection, judges give to form, four points; substance, three; distribution or harmony two, and size, one.

The pansy has undergone some changes within the last twenty-five years; the class of fancy pansies, of which fine specimens have been shown here by E. L. Beard, has been introduced within that time. But the culture remains the same, the requisites being young plants, rich mould, and a regular degree of moisture. Those about to commence should procure a three light frame, a few dozen well selected plants, a cartload of good loam, and some rotten leaf-mould, sand, and thoroughly rotted cow manure.

Horse manure should be avoided. The bed should be prepared as early as the ground and weather permit. It should not be exposed to the full glare of the sun; and if the soil is naturally poor, wet, sodden, heavy, or sandy, these evils must be counteracted by striking the medium. The plants should be set a foot apart and six inches from the edge of the bed, and should have a good watering after being planted, and the surface of the bed must be often stirred. In dry weather it must be watered with a fine hose every evening, not merely wetting the surface, but thoroughly. The beauty of the first bed will be over by July; if necessary to replant, young plants should be prepared in the interval from cuttings; or by dividing the old plants and adding manure a good bloom may be obtained in autumn. But a good substitute may be found in a few choicely selected verbenas, or other bedding plants, thus giving the amateur ample time to prepare a fine batch of plants for the coming year. Though the pansy suffers very little from frost, it should be well protected in very severe weather. To keep up a good variety, select the best seed and mark each color separately. Mr. Atkinson said that he had, at the time of speaking, plants in a three-light frame, which he should transplant in the spring into a border, shielded from the noonday sun by trees, where they have always done remarkably well.

CARNATIONS. The present perfection of this delightful "florist's flower" is the result of long and patient industry. At the beginning of the eighteenth century it numbered between five and six hundred varieties. Throughout the civilized world it is an especial favorite; its simple and graceful beauty, and, above all, its delicious fragrance, have an irresistible charm over all hearts. In its normal state it can be found among the Swiss Alps, and occasionally in the southern parts of England, upon the broad ridges of castle walls and ancient buildings.

The parent of the present carnation of the florist is botanically designated *Dianthus Caryophyllus*, and from this has sprung sufficient to supply the most capacious taste. It has a sportive power of self-variegation and activity, to keep even a morbid love of novelty in constant play; but such are the requirements of the present standard that scarcely one in a thousand possesses sufficient interest to command more than momentary attention. As excellence in variety has increased, fastidiousness has kept step to reject from the very name of carnation all such flowers as have the

prevailing red color of the clove-pink, and all others, be what they may, which have not a ground of pure, unspotted, untinged white. All carnations, understood within these restrictions, are classified as Bizarres, Flakes, and Picotees, and are again distributed into two other sub-divisions. Bizarres are striped with two colors on the white ground, and have their colors in irregular variegations; Flakes are striped with one color on the white ground, and have their stripes large and extending across the petal. Picotees are pounced and spotted in a very diversified manner on their white ground, and are more hardy and generally smaller than the other classes. The bizarres generally show a greater proportion of one of the striping colors, yet those are held in the highest estimation which exhibit the two colors in equal proportion, with the stripes running parallel to each other and distributed equally over the flower. The same may be said of flakes, which too often exhibit too much or too little of the striping color. Those are the best which exhibit the striping and ground colors in well balanced proportions. Formerly the distinguishing character of the picotee was the notched or fringed edge, but such will not now pass muster, where judges and growers are even indifferently posted up. They must possess the smooth edge, or what is technically termed *rose leaf*, and their colors must be bright, clean, and well defined. Scarlet bizarres are striped on their white ground with scarlet and maroon, and the varieties of these are such as differ in the intensity of their colors. Crimson bizarres are striped upon their white ground with either pink and purple, or rose and purple. Flakes are distributed into three sub-divisions, viz., scarlet stripes, rose and pink stripes, and various hues of purple; but in each sub-division there is a great diversity in the shading of its characteristic color.

Picotees, which are very numerous and diversified in variety, are distributed into four sub-divisions, with respectively scarlet, crimson, rose, and purple colors, and are severally distributed into two groups, the one heavy-edged, or having the color thickly laid on round the margin of the petals, and the other feathered or light-edged, with the color touching the petals in an unbroken and very delicate line.

Much diversity exists as to the best method of cultivating carnations; it is a topic that has been very copiously discussed, but can be very easily and satisfactorily disposed of in a few words. In

Europe they, i. e. "show varieties," are universally cultivated in pots ; but that method is totally unsuited for practice here. Good, deep, garden soil (yellow loam is preferable), enriched with thoroughly rotten cow manure, some leaf soil, and, if too adhesive, some sand, are requisite. Dig deep and thoroughly, and when the weather is fairly settled, set out the plants nine inches by twelve apart, and stir the surface frequently. When the buds become fully swollen, and before they burst, a ligature should be tied around each pod, half-way down ; when the bursting commences, take hold of each division of the calyx, and turn it down to the ligature. The weather about the time of flowering is usually bright and hot, thus prematurely hastening the development of the flowers. An evening visit with the water-pot, sprinkling in and around the plants, but not over the flowers, is beneficial. Shade, too, in the hottest part of the day is necessary. For the real amateur, cotton cloth, attached to a roller and fixed on a neat skeleton framework, so as to let up and down at pleasure, is the thing. Second-hand fishing nets or seines, stretched double over stakes sufficiently high to allow of walking under them, are a very good contrivance, and need not be moved until the bloom is over. In Europe they display six or eight flowers, supported by a stake, but the speaker said he liked a good mass rather than a few.

As soon as the "grass" is ready for layering, this should be done, thus obtaining strong plants by the middle or end of September, when they should be transferred to their winter quarters. These should be prepared by making a bed the size of your cold frame and planting it thickly ; by the end of November, strew two or three inches of dry tan, or, which is preferable, pine needles, among them ; put on the frame, add a few more pine needles, place the sashes over them, but give all possible air ; exclude nothing but heavy rains, snow, and extreme frost. When bright, lovely, smiling May comes round again, transfer them to more agreeable and attractive quarters, and there induce them to become, as they truly are, "Jove's own flowers."

E. W. Wood was called on by the President, and said that the carnation is grown extensively under glass, and usually in a house by itself. Those who make a business of growing it, can afford to give it a separate house, as it does not do well with other plants, wanting a cooler temperature. The cuttings are put in in January,

and after striking are potted in three-inch pots, and put in frames, where they grow slowly; early in May they are planted out. The speaker had set plants the first day of May, and on the third sufficient snow fell to cover them without doing any injury. The bloom depends on the strength of the plants. He sets them fourteen inches apart each way and nips them back during the summer: this is necessary to make them bushy. About the 10th or 15th of September, they are taken up and transferred to the greenhouse. Some cultivators put them in six or eight-inch pots, and he formerly did so, but now he put them directly into the beds, which succeeds better and saves labor. If the weather is warm, they must be shaded. They will come into bloom almost immediately. He had not succeeded in producing continuous bloom, but had seen it done. He has them in a house with a span-roof, where the sun does not strike for thirty days in winter, but in February they will bloom, and he will take them out about the 10th of June. He has cut as many blooms in this house on the 30th of May, as at any time.

The pansy is one of the most desirable and satisfactory flowers. It can be grown by everybody. He puts a hundred and sixty plants in a frame three feet by six, which is four times as many as he will leave there, and covers them with mats to keep out the frost. At the time of speaking they had been in bloom for some weeks, and had been uncovered but once. In spring he will take out three-quarters of them. The bed faces the south. He makes the soil as rich as he can.

William C. Strong said that for commercial purposes it is hardly necessary to pot small carnations singly; they may be taken from the cutting bed and set in "flats," and planted out about the first of May. He knew this method to be successful. The soil should be rich, but not with undecomposed horse manure, which when mixed with loam makes it too light; and is especially injurious in the house. A cool house, especially devoted to the carnation, is best.

Henry Ross said that he sows pansy seed in the house and pricks off into hot-beds, using the same soil as for lettuce. He puts in carnation cuttings in January or February, and plants out in May, in soil not richer than if for potatoes. They want a cooler house than bedding plants. In the house he formed a large bed for them on a plank bottom over the water-tank, with eight inches of soil, rich with manure, leaf-mould, and hot-bed material.

Col. Henry W. Wilson said that the pansy can be cultivated very satisfactorily by ladies and young people, who can derive a great amount of pleasure from the cultivation of plants that would not take high rank when measured by established standards of excellence. He would not care to save seed unless the varieties were very choice. The soil should be the average compost of well rotted turf, sand, and well decomposed manure. The chemical action of undecomposed manure is very injurious. If the seedlings are planted in a box, they will fill the soil with roots so that it can easily be cut up into sections with a knife, and taken up with the plants when they are transplanted. Irrigating pansies and carnations is better than watering them over the flowers. He had effected it by placing a cask of water at the head of a sloping bed, and arranging little channels so that the water would flow among the plants. He objected to an arbitrary standard of perfection for pansies, as tastes might differ; some might fancy black flowers, while others might like the bronze.

Edward L. Beard said that the carnation is never seen in such perfection as in the humid climate of England. The average carnation here is not a success. The speaker lately received from England twenty varieties, in cuttings rooted in two or three-inch pots, which are as robust as cabbages, and this vigor is due to the conditions of climate. They are fond of lime and he puts lime rubbish in his pots, and they forsake all other soils for that. Lime is deficient in our soils. It is an enemy to all worms, which are very destructive to carnations, especially a little white worm that attacks the roots; but lime is a preventive of its injuries. In potting some carnations, he left two without lime, which were both attacked by this white worm and died, while all the others were promising. Our summers are too hot as well as too dry for carnations, and when cuttings are left, either by amateurs or commercial florists, to take their chance, they fail in getting strong plants. The new kinds are not grown to compare with the old varieties. The speaker has raised some good seedlings; among others a true scarlet, and he thought this a good field for raising seedlings. The carnation must have peculiar conditions of soil and atmosphere, and the red spider and green fly must be kept from them; many collections suffer from these insects.

The pansy is easy to grow, but it is not so easy to get a good strain; our growers have not the patience to comply with the

necessary conditions. A package of seed will produce many varying kinds, but the florist's ideal is difficult to get. You may find in a package twenty-five good kinds, with perhaps one *rara avis*, and if you are willing to sacrifice the rest, and take up those saved, the last of April, and plant them on the north side of a fence, putting in a load of leaf-mould, and then go on with hybridizing, isolating the plants, you may get one pod of good seed from each plant. The pansy does not bestow its gifts at sight; like good people, good pansies are scarce. There is the same trouble with them as with carnations; they deteriorate in summer, and the speaker throws them away in midsummer. They will not form seed in a hot, dry atmosphere. He thought better strains could be procured from the continent of Europe, than from England. The wonderful English and Scotch varieties exist on this side of the Atlantic only in fiction, and the named varieties of this class are difficult to import. He has saved good seed and raised good varieties. The quantity was comparatively small, but some of the seed was of the best quality. Pansies must be brought into flower early in spring; those produced the last of May are poor in comparison with the early blooms. There is a mistake in manuring them too heavily in cold frames; he had planted some without a layer of manure underneath, which he sometimes gives them, and others with leaf-mould preponderating, and liquid manure as the plants came into flower, and they did better than those heavily manured. Heavy manuring breeds slugs, which are very injurious, especially in heavy clay soils, where they will cut the flowers all to pieces. The remedy is to strew soot among the plants. He would put his money into leaf-mould for pansies, rather than into manure. The only way to keep pansies from deteriorating in hot weather is to lift the plants from the frames, and set them on the shady side of a fence or wall. The pansy ought to be viewed by some standard, and there is no question that the large, regularly formed, and distinctly colored and marked flowers are more beautiful than the washy ones so common in commerce, where the colors are run together, without being distinctly outlined according to the florist's ideal.

Hon. Marshall P. Wilder confirmed what the preceding speakers had said, and added that he had grown the carnation only in pots, and that he could do nothing with them unless he kept them as cool and as near the light as possible. He wondered that with our

clear, bright sun, which perfects seed so admirably, more had not been done here in hybridizing, especially with the encouragement derived from our success with the camellia and azalea, in which we have equalled, if we have not surpassed, any other part of the world.

Mr. Atkinson said that the high standard pansies, whose existence Mr. Beard had doubted, do exist, but the seed cannot be purchased. Charles Turner told the speaker that anybody was foolish to expect to get the best quality of seed; that was always reserved. Every grower must save the best every time and always. You must save your own seed if you want the best, for the growers do not produce it in sufficient quantity. As to the standard of a perfect pansy, no one is compelled to adopt it, but it is absolutely necessary to have a high standard. The carnation is often found by the side of old walls, showing the importance of lime to its growth. In his remarks on the carnation he spoke of it exclusively in pot culture, and not of tree carnations.

The subject for the next Saturday was announced as "The Culture of Hybrid Perpetual Roses, for Private Gardens, for Sale, and for Exhibition Purposes."

BUSINESS MEETING.

SATURDAY, December 29, 1883.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Hon. FRANCIS B. HAYES, in the chair.

Hon. Marshall P. Wilder announced the decease of Dr. Louis Édouard Berckmans, of Rome, Georgia, a corresponding member of the Society, a pupil of Van Mons, and a co-worker with Esperen, Bivort, and other leading European pomologists, and himself eminent among them. He moved the appointment of a committee to prepare memorial resolutions, which motion was carried and the Chair appointed Mr. Wilder, Leander Wetherell, and John C. Hovey, as that Committee.

The meeting was then dissolved.

MEETING FOR DISCUSSION.

THE CULTURE OF HYBRID PERPETUAL ROSES, FOR PRIVATE GARDENS, FOR SALE, AND FOR EXHIBITION PURPOSES.

E. W. Wood was called on, and said that he should speak first of roses in private gardens. Great improvements have been made in Hybrid Perpetual Roses in the last ten years, and especially in the continuity of their bloom, so that they are now much more desirable than formerly, and are better entitled to the name of Perpetuals. In laying out grounds, it was formerly an objection to beds of roses on a lawn, that they were not handsome after blooming, but, now, with careful selection of varieties, a bed may be made an ornament to the front lawn, or worthy of the most conspicuous place in the flower garden, from the time when they begin to bloom until frost, and will afford flowers for cutting every day; in short the Hybrid Perpetual Rose has become one of the most satisfactory flowering plants.

For market, Hybrid Perpetual Roses take precedence of all other flowers. Some florists have discarded all other flowers, and give their attention wholly to roses. We are favorably situated for growing Hybrid Perpetual roses under glass, especially the bright colored kinds, and in New York we may see in the florists' windows "Boston rosebuds" offered for sale. The New York florists have taken the most skilful rose growers from the houses here, but even then have not succeeded in equalling those grown here. More money is invested in the cultivation of roses for sale, than in that of any other flower, and the cultivation is increasing, both under glass and out-doors. It is one of the most profitable summer flowers. The showy newer varieties are valuable not only for their beauty, but for profit.

The increase in the exhibition of roses is shown by the very gratifying increase in the number of contributors to our shows. For cultivation under glass, it is a great help to bud roses on the strongest growing stocks, as they are much more vigorous and afford a profusion of bloom. This method is adopted by the best English exhibitors, and here Mr. Dawson, of the Arnold Arboretum, has been experimenting to ascertain the best stocks. It has been objected that stocks throw up suckers, which injure the grafts, and the speaker had seen such cases, and a friend related

an instance where, on pulling off the suckers from a lot of imported roses, which appeared to be growing very vigorously, half of them were found entirely, and others nearly dead; but there is little difficulty in distinguishing between the shoots from the stock, and those from the graft, and the former will do no injury if taken off seasonably.

President Hayes said he had seen roses displayed in the florists' windows in Ottawa and Montreal, Canada, labelled "Boston buds."

William H. Spooner said that the rose is a thing of beauty and therefore a joy. It is the leading flower of our gardens today. He prefers them, both for garden and exhibition purposes, grafted on the Manetti stock; for light soils such are certainly preferable. The bud or graft should be inserted not more than six inches from the roots, and when finally planted should be set two or three inches under ground, when it will send out roots the first year. The past season has been very unfavorable to roses, on account of the extreme drought. Boieldieu, Mlle. Marie Rady, Comtesse Serenye, and Elizabeth Vignerou, have proved almost entire failures. The buds were so tight that they would not open. Mme. Gabriel Luizet proved beautiful under the trying season. Alfred Colomb, Jean Liabaud, Victor Verdier, and J. Stuart Mill, have done well; Magna Charta did admirably, growing well and flowering freely, and proving hardy. La Rosière, a dark kind, very much like Prince Camille de Rohan, if not identical with it, has done better than ever before, as have also Abel Carrière, and Jean Soupert. The Duke of Wellington was fine. The Climbing Victor Verdier is one of the best garden roses. The Cheshunt Hybrid has Tea foliage, and suffered from the winter, but in an ordinary season would prove hardy. La France and Souvenir de Mons. Boll did well. The Climbing Bessie Johnson is a very strong grower and flowered freely. Mabel Morrison proved not to be a good bloomer in dry weather. Firebrand proved a strong grower, but a poor flowerer. Marie Baumann, an old kind, did well. Baron de Bonstetten is among the best. Charles Lawson, a Bourbon, gave a mass of bloom, but is not suited for exhibition. John Hopper is good. The Duke of Edinburgh is not up to the standard. Jules Margottin and the climbing variety of the same, both did well.

Some of the Hybrid Perpetual roses have very beautiful foliage. Dupuy Jamain is almost as good in this respect as Baroness Rothschild. Captain Christy is a Hybrid Tea, with beautiful foliage, but

a little tender. Mme. Charles Wood is a good flower, but the plant is a poor grower. Louis Van Houtte is the best rose of its color, but is not very hardy and has proved almost a total failure. Senateur Vaïsse is an admirable garden rose, and so is the Marquise de Castellane, in most seasons. Dr. Andry is perfectly hardy, but Mme. Eugénie Verdier is a little tender. Fisher Holmes is an improvement on Gen. Jacqueminot. With the multitude of varieties, the Hybrid Perpetuals are the class for general cultivation. Some of the newer shades are very desirable. Moss roses did not generally do well the past season. Of the three perpetual varieties, Salet, Mrs. W. Paul, and James Veitch, all flowered well; the last is a dark kind but not a very good grower. The Common Moss did not do well. Laneii, which is the next best, did well. The Crested Moss, which is never very healthy, will flower freely if it can be made to grow vigorously.

In answer to an inquiry whether as good varieties of roses could not be produced here as in Europe, Mr. Spooner said that they could, but the European growers have the advantage of larger stocks, to hybridize and produce seed from.

Joseph H. Woodford said that roses will stand any quantity of manure. He knew a grower who dug trenches between his roses and buried the contents of his cesspool in them to their great advantage. The reflection of the sun from the snow, when the sap is just starting, will burn the bushes; a little litter thrown over them will prevent this. It is true that budded roses are apt to throw up suckers, but any one at all familiar with them, can distinguish the suckers from the grafts. The best way is to put the whole stock under ground, and get them on their own roots. He would not grow roses long in one place, but would renew them once in four years, if wanted for exhibition. They are much better from young, vigorous plants than from old, gnarled roots. He has some fifteen years old, which he cuts in closely, and gets good blooms from them, but not as good as from younger plants.

Mr. Spooner said that he has plants of the Duke of Edinburgh, which have been standing ten years on the same spot, and give as good blooms as ever.

Edward L. Beard said that there is no question that roses deteriorate by standing long in one place. In England, rose growers exhibit flowers chiefly from one year old plants, known as maidens. Most of them change the soil every year; roses will exhaust it in

two or three years, and by constant manuring it becomes too light and friable for the needs of the rose. The second year the plants are cut back. They must be shifted from year to year, for no feeding will take the place of shifting; manure will not supply the want of fresh loam. Where a rose has done well one season it will not always do so the next. The difference is caused by the difference in the ripening of the wood; in autumn the wood of some is hard and well ripened, while that of others is soft and green when the fall frosts come. The *Baroness Rothschild* is irregular in blooming, and in this climate is a failure out-doors; a good bloom is the exception. The transition of roses from rest to bloom is too sudden here, and they do not do as well as in England, where it is more gradual. The darker roses rarely reach perfection out-doors here, and many of the newer shades are of doubtful permanent success. *Gloire de Bourg la Reine*, for instance, fades so rapidly as to be worthless, and we shall have to adhere to the standard kinds. His great theory is that change of soil is essential to success, and rose growers are fortunate if they have the opportunity to act upon it.

William C. Strong agreed with Mr. Beard as to the necessity of change in soil, because in supplying food we change the character of the soil. The rose requires a compact soil; one approaching clay is best, but by applying cow manure we make the soil so light that the roots suffer. The *Manetti* stock is adapted to heavy as well as light soils. Mr. Strong alluded to the rose grafted on a *Japan* stock, exhibited by Mr. Dawson of the *Arnold Arboretum*, and said that he was struck with the result, but his own experience with that stock had not been satisfactory. The plants have not flourished as well as those on the *Manetti* stock. They have done well at the *Arboretum*, in light soil, out-doors, and have also succeeded in pots. There is no reason why we should not propagate roses here as readily as abroad; cuttings of soft wood root freely, and we can graft the *Manetti* stock with scarcely a miss; budding is not so successful. For the public, grafting is the best way of procuring plants.

Mr. Strong thought exhibitions of roses very misleading, and that there should be some way of making distinctions that would guide the public. The visitors are enthusiastic, and get the varieties they see in the prize stands, and are doomed to disappointment, because they are unable to give them the care requisite to

produce perfect blooms, and it cannot be expected that the public generally ever will give such care. He agreed with the last speaker that the new roses, with delicate shades of color, are of doubtful permanent success, though possibly care may preserve them. Our exhibitions rival those of England, but the new hybrid kinds cannot be produced by the public generally. They want hardy kinds, like Baron Prevost, though they may not take the first prize. If we lead the public up to too high a plane, they will be discouraged and give up; but there are roses that can be produced by the majority of cultivators with great success, and that will give great satisfaction.

John G. Barker agreed with the last two speakers in regard to the advantage of changing the soil for roses; where there are but a few beds it is not difficult to change the plants and the soil. There is no doubt that beds of roses can be made beautiful through the season. He covers the soil in his beds with pine needles, and plants gladioli between the bushes, which hide the mulching, and then edges with candytuft, sweet alyssum, or mignonette. The kinds he has selected are all among those mentioned by Mr. Spooner. He cultivated Safrano, Bon Seline, and other tender kinds in a bed at the Botanic Garden, where they stood for several years. They were covered with leaves, and stakes were driven down, with cross pieces firmly fastened to the tops so that heavy snows should not break down the bushes. If taken up and put in frames they are preferable to bands of coleus and iresine for ornament. Both hardy and tender kinds can be made to yield such effects as cannot be produced by bedding plants.

Mr. Strong spoke of the Japanese *Rosa rugosa* as of very luxuriant and dense growth and fine foliage. It is beautiful in bud and flower (though the flowers are single), and also when the hips are ripe. It produces a striking effect at a distance.

Mr. Barker recommended grouping this species on the shady side of beds of hardy shrubs.

Mr. Wood said that a few years ago he set out twenty-four Bon Seline and the same number of Safrano roses, and put boards round them and tied down and covered the plants, and they came out in spring in excellent condition, but he did not cut a perfect bloom before the first of September, which was not long before they were cut off by frost. Both these kinds will form buds freely all

summer, but the hot sun burns them, and therefore such a bed must be partially shaded ; it will not do in the full sun.

Mr. Beard agreed with Mr. Wood in regard to tender roses, and said that he had planted thirty or forty bushes, which have stood the winters. The varieties chosen by Mr. Wood were not so good for the purpose as the more double kinds, such as Homer, Agripina, and Souvenir de la Malmaison, which come to greater perfection. There is no question that they are hardy enough to stand the winter with sufficient covering. If they are killed down they will send up strong shoots, but will give no bloom until cool weather.

Mr. Spooner said that Gloire de Dijon, Devoniensis, etc., came through the winter with protection, but did not flower freely.

Hon. Marshall P. Wilder said that this discussion showed that the Society has made great progress in the fundamental principles of rose culture, and in establishing what constitutes a good rose, desirable for general cultivation here. Many years ago he carried off the Society's prize for the best collection of roses, for nine successive years. Since then he has seen great changes ; we have learned to classify the collections, which were then miscellaneous, and have learned the constituents of a perfect rose. Many of the varieties mentioned by Mr. Spooner have taken their places as permanently as the Baldwin apple or Bartlett pear. Baronne Prevost, John Hopper, and Dr. Andry, have such constituents of excellence that, though better kinds in some respects may exist, all things considered they will retain their places for years to come. We have already got large collections of roses, but we desire fragrance, and hybridizing with Tea roses gives this, but it also gives tenderness, yet, by covering them up, and great care, we can carry the Hybrid Tea roses through the winter and get some good blooms, but they will never be permanent dwellers in our gardens. The Salet and Laneii are the only moss roses he cultivates ; the latter is robust, and, unlike most moss roses, makes good roots. Mr. Wilder related an anecdote of George C. Thorburn, who imported a lot of the Common Moss rose, and wrote back to the European nurseryman that our American cultivators preferred roses with roots. The Laneii is hardy and a strong grower ; it will take care of itself, and will not be displaced. It is of better color than the Common Moss, but not quite so mossy. The Manetti stock was introduced by Thomas Rivers fifty years ago, and the speaker had never found one equal to it ; but the

rose grower must be wide awake, and not let the suckers from the stock rob the graft. The stock must be buried below the surface. He wondered that more varieties of Hybrid Perpetual roses had not been produced here, and spoke of the success attained by the late Henry B. Ellwanger in this direction, and of the loss to horticulture in his death. Mr. Ellwanger's effort was to add fragrance to the Hybrid Perpetual rose, and he had produced one as good as the Alfred Colomb, which he named for the speaker.

President Hayes said that he had learned from these discussions how to cultivate roses. He had been successful in growing them, and believed in changing the soil; they do not give satisfaction when remaining in one place for a long time.

Mr. Strong dissented from the opinion that grafted roses generally root from the graft. His experience had been that it happens only in rare instances, and he doubted the advantage if they did, for the Manetti stock is so much more vigorous.

Mr. Spooner said that he knew that many varieties, among which are Prince Camille de Rohan, John Hopper, Magna Charta, Avocat Duvivier, and Jules Margottin, do root freely from the graft.

On motion of E. W. Wood, a Committee, consisting of John B. Moore, William H. Spooner, E. W. Wood, William C. Strong and Marshall P. Wilder, was appointed to report a list of the best hardy roses as continuous bloomers in out-door culture, and a list of the best hardy roses adapted to general cultivation.

The subject for the next Saturday was announced as "Manures; their Preparation and Application."

REPORT
OF THE
COMMITTEE ON PLANTS AND FLOWERS,
FOR THE YEAR 1883.

By WILLIAM H. SPOONER, CHAIRMAN.

At the close of the year's official duties, there is some satisfaction in taking a brief retrospect of its work. While our position involves weekly labor and responsibility, there is compensation in the endeavor to add something to the general interest in floricultural subjects.

The exhibitions, as a whole, have not reached the standard of former years, with the exception of the Annual and Chrysanthemum Shows; the former, in choice plants, was uncommonly fine, and the latter was never equalled. It is many years since cultivators have had to contend with such a long-continued season of extreme drought, and it undoubtedly affected the general exhibits.

We desire to call attention in the Prize Schedule for 1884, to the changes in the Azalea and Rose show in March, particularly to the additional prizes for bulbs, which it is hoped will greatly add to the interest and success of the show; to the additions at the Rose Exhibition, in June, and also to the important changes and additions to the prizes for the Chrysanthemum Show.

We will first notice the

AZALEA AND ROSE SHOW.

MARCH 22.

For the display of Indian Azaleas, we were again indebted to Hon. Marshall P. Wilder, whose enthusiasm in the cultivation of this beautiful plant continues unabated. The prizes were all awarded to Col. Wilder, with the exception of one for a specimen plant, to John L. Gardner.

Hybrid Perpetual Roses, in pots, were very poor. Of cut blooms, an unusually fine display was made by John B. Moore & Son and William C. Strong; there were also splendid blooms of Maréchal Niel, from E. M. Wood & Co.,—the largest and most perfect specimens of this rose ever shown in our Hall. Mr. Wood's facilities for growing this beautiful rose are unsurpassed; he could cut at one time about ten thousand blooms.

Orchids were exhibited by H. H. Hunnewell and F. B. Hayes. Greenhouse plants were shown by H. H. Hunnewell and John L. Gardner. There was no exhibit of hardy shrubs, cyclamens, pansies, or tulips. Fine Heaths were shown by Francis B. Hayes and John L. Gardner; the latter also exhibited excellent Primulas. Good Cinerarias were presented by William Patterson, and the best violets shown for several years were also from him, and from John L. Gardner. The latter was the only contributor of forced bulbs, and, as usual, excelled in well-grown hyacinths. Camellias were exhibited by Francis B. Hayes, Hovey & Co., and Marshall P. Wilder.

E. M. Wood & Co. contributed a group of the beautiful *Lilium eximium Harrisii*.

Woolson & Co., of Passaic, N. J., presented an interesting collection of Narcissus, a class of plants rapidly becoming popular for forcing and for garden culture. E. L. Beard's display of Fancy Pansies, was remarkable, not only for the wonderful beauty and variety of color, but for the large size and perfect form of the flowers; they were the best ever shown.

Henry R. Comley exhibited seedling carnation No. 1; color, pure white, serrated edges, perfect flower, with no indication of bursting; very fragrant and a free bloomer. Also, No. 2, white, inner petals delicately tinted pink, serrated edges; and No. 3, creamy white, serrated edges.

PELARGONIUM EXHIBITION.

MAY 12.

This was again a failure, not a single competitor offering for any of the prizes for pelargoniums.

John L. Gardner and Marshall P. Wilder were contributors of Indian Azaleas; from the latter came Louis Van Houtte; color, delicate rose, edged white, lower divisions dark purple; also,

Mme. Iris Lefebvre, color pure white, striped with pink; and Jean Vervaene. The most noticeable plant of the exhibit was from S. R. Payson, viz: *Dendrobium Falconeri*.

Admirably grown Tulips were shown in good varieties by John L. Gardner, and Hyacinths by Miss E. M. Harris. From William A. Bock came excellent seedling Pelargoniums; there were also fine named kinds from E. Sheppard.

RHODODENDRON SHOW.

JUNE 9 AND 13.

The dry weather proved a serious drawback to this exhibition, and the postponement of the awards of the Hunnewell Premiums from the 9th to the 13th was an unfortunate error in judgment on the part of the Committee. H. H. Hunnewell and President Hayes contributed fine blooms on the 9th and also on the 13th (the former not competing for the prizes), but the very warm weather had seriously affected the flowers by the 13th.

President Francis B. Hayes was the chief contributor for the leading prizes, receiving the first prizes for twenty-four, twelve, six, and three tender varieties; and also for a single truss of any tender variety, which he took with Duchess of Bedford.

John L. Gardner was first for eighteen hardy varieties, and Hovey & Co. were second. President Hayes was first for ten hardy varieties.

E. Sheppard was the only contributor of Hardy Azaleas, and received the first prize. The awards for Tree Pæonies and German Iris were made on the 9th; the first, as usual, to Marshall P. Wilder; and that for Iris, to Francis B. Hayes.

Cut flowers were excellent, the display being made by W. K. Wood, Mrs. E. M. Gill and Miss S. W. Story.

Hardy Clematis were shown, of better quality than for several years, by Joseph H. Woodford, and John B. Moore & Son.

Francis Parkman presented some very good seedling Ghent Azaleas.

From Hovey & Co. came seedling Cereus No. 2, C. M. Hovey. From the same came also a semi-double seedling Azalea; color, pure white with lemon centre.

ROSE AND STRAWBERRY EXHIBITION.

JUNE 26.

Probably no plant suffered more from the extremely dry season than the Rose, especially when this followed a severe winter like the last; from these causes the Annual Rose Exhibition did not equal that of last year. A large number of flowers were shown, but none of them were of superior quality. Sunday and Monday immediately preceding the show, were among the hottest days of the season, so that many of the best blooms were burned on the bushes. Such varieties as Alfred Colomb, E. Y. Teas, and Boieldieu, were destroyed for exhibition purposes; even Mme. Gabriel Luizet, one of the finest of all roses for general culture, could not bear the severe scorching, while the dark varieties, such as La Rosière, Abel Carrière, Prince Camille de Rohan, Jean Liabaud, and Mons. Boncenne, were badly burned. The principal contributors were John B. Moore & Son, John L. Gardner, Francis B. Hayes, Warren Heustis, John S. Richards and William H. Spooner. Ellwanger & Barry, of Rochester, N. Y., presented a large collection.

SUBSCRIPTION PRIZES FOR HYBRID PERPETUAL ROSES.

These were again sharply contested for.

A Silver Vase, value \$50, for twenty-four roses of different varieties was awarded to John L. Gardner; no list of varieties was furnished.

A Silver Vase, value \$15, for three roses of different varieties, to Warren Heustis.

A Silver Vase, value \$25, for six roses of different varieties, to John S. Richards.

A Silver Vase, value \$15, for three Roses of one variety, to John L. Gardner for Abel Carrière.

A Silver Vase, value \$25, for six roses of one variety, to Francis Skinner, Jr., for Charles Lefebvre.

A Silver Challenge Vase, value \$200, for twenty-four varieties, three specimens of each, to John B. Moore & Son, for the second time. The varieties shown were:

Abel Carrière,
Alfred Colomb,

Annie Wood,
Baroness Rothschild,

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| Boieldieu, | Mme. Gabriel Luizet, |
| Camille Bernardin, | Mme. Marie Finger, |
| Comtesse de Serenye, | Mme. Victor Verdier, |
| François Michelin, | Mons. Boncenne, |
| Hippolyte Jamain, | Paul Neyron, |
| Jean Soupert, | Perfection de Lyons, |
| Magna Charta, | Pierre Notting, |
| Marchioness of Exeter, | Prince Camille de Rohan. |
| Maurice Bernardin, | Souvenir de Spa, |
| Mme. Boutin, | Thomas Mills. |

SOCIETY'S PRIZES.

For twenty-four distinct varieties, two of each, John B. Moore & Son were first, with

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| Alfred Colomb, | Jean Liabaud, |
| Baroness Rothschild, | Jean Soupert, |
| Barthélemy Joubert, | Marie Baumann, |
| Boieldieu, | Marguerite de St. Amande, |
| Camille Bernardin, | Mme. Victor Verdier, |
| Caroline de Sansal, | Paul Neyron, |
| Charles Turner, | Prince Camille de Rohan, |
| Duke of Connaught, | Richard Laxton, |
| Duke of Edinburgh, | Richard Wallace, |
| Dupuy Jamain, | Senateur Vaïsse, |
| Étienne Levet, | Souvenir de Spa. |
| Fisher Holmes, | S. Reynolds Hole, |

For the best twelve and six, J. S. Richards was the successful competitor; no list of varieties was furnished.

Moss ROSES. — For the best six, the first prize was awarded to John B. Moore & Son; for the best three, to William H. Spooner, for Crested, Common, and White Bath.

All the prizes for the general display were awarded, the contributions being numerous; the first was gained by Norton Brothers.

STOVE AND GREENHOUSE PLANTS. — The best six varieties were contributed by John L. Gardner and Hovey & Co. For a single specimen, the first prize was given to John L. Gardner, for *Erica ventricosa Bothwelliana*. Of Orchids, three varieties were presented by F. L. Ames and R. M. Pratt, receiving the first and

second prizes, respectively. For a single plant, the prize was awarded to H. H. Hunnewell, for *Odontoglossum vexillarium*. A miscellaneous collection of Orchids was exhibited by F. L. Ames.

Clematis were shown by Francis B. Hayes; excellent seedling Gloxinias by John B. Moore & Son; displays of flowers by E. Sheppard, Mrs. L. P. Weston, Miss S. W. Story, and Mrs. E. M. Gill. From C. J. Power came a collection of plants grown in moss, and from John C. Hovey came the Herbaceous Pæony, No. 3, Grandiflora; flower large, very double, opening flat; color, light rose, very fragrant,

ANNUAL EXHIBITION.

SEPTEMBER 18, 19, 20, AND 21.

The arrangement of this exhibition was entirely different from any adopted in former years, and it seems to us a change in the right direction. The plant and flower department of our shows is constantly increasing, and it has been apparent for several years that more room was needed for the proper display of the plants. This year the entire upper hall was devoted to plants and flowers, the former being arranged on platforms on each side of the hall, in front of the mirrors, thus giving more space to each contributor. The reflection of the plants in the mirrors, added greatly to the general effect. Between the mirrors were stands for cut flowers, while in the centre of the hall tables were placed for miscellaneous displays of plants and flowers. This arrangement proved much more satisfactory to exhibitors, and a large number of visitors expressed their appreciation of the change.

STOVE AND GREENHOUSE PLANTS. — In the display of these, F. L. Ames was first, with

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|----------------------------------|------------------------------|
| <i>Alocasia Sedeni,</i> | <i>Croton Mortii,</i> |
| <i>Alocasia Thibautiana,</i> | <i>Dion edule,</i> |
| <i>Alocasia zebrina,</i> | <i>Kentia australis,</i> |
| <i>Anthurium Veitchii,</i> | <i>Maranta Makoyana,</i> |
| <i>Anthurium Warocqueanum,</i> | <i>Maranta Veitchii,</i> |
| <i>Asparagus plumosus nanus,</i> | <i>Phyllotænium Lindeni.</i> |

IN SPECIMEN FLOWERING PLANTS, President Francis B. Hayes received the first prize for six varieties. For a single specimen,

F. L. Ames was first and second with *Dipladenia Boliviensis* and *Epidendrum prismatocarpum*.

FOR VARIEGATED LEAVED PLANTS, six varieties, Hovey & Co. were first, with

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| <i>Alocasia macrorhiza,</i> | <i>Eurya latifolia,</i> |
| <i>Ananassa sativa,</i> | <i>Phormium Colensoi,</i> |
| <i>Dieffenbachia Bausei,</i> | <i>Yucca quadricolor.</i> |

The best single specimen came from John L. Gardner, *Eurya latifolia* var.

FOR CALADIUMS, the first and second prizes were awarded to Waldo Adams.

• FOR FERNS, six varieties, to F. L. Ames, for

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|--------------------------------------|--------------------------------------|
| <i>Davallia Mooreana,</i> | <i>Nephrolepis davallioides fur-</i> |
| <i>Gleichenia Mendelii,</i> | <i>cans,</i> |
| <i>Lastræa Richardsii multifida,</i> | <i>Polypodium ornatum.</i> |
| <i>Microlepia hirta cristata.</i> | |

Mr. Ames was also first for Adiantums, with

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| <i>A. concinnum latum,</i> | <i>A. scutum,</i> |
| <i>A. Peruvianum,</i> | <i>A. trapeziforme,</i> |
| <i>A. princeps,</i> | <i>A. Williamsii.</i> |

FOR a TREE FERN, Hovey & Co. were first with *Alsophila australis*.

DRACÆNAS, six varieties, came from S. R. Payson, viz. :

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| <i>D. amabilis,</i> | <i>D. Hendersonii,</i> |
| <i>D. Baptistii,</i> | <i>D. Shepherdii,</i> |
| <i>D. Goldieana,</i> | <i>D. Youngi.</i> |

FOR CROTONS, F. L. Ames was first, with

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|--------------|------------------|
| Baron Frank, | Neville, |
| Cronstadt, | Prince of Wales, |
| Hawkeri, | Queen Victoria. |

For a single specimen of PALM, the first prize was awarded to Hovey & Co. for *Pritchardia Pacifica*.

NEPENTHES, — three plants ; the first prize for these was awarded to F. L. Ames, for *N. Hookeriana*, *N. Intermedia*, and *N. Rafflesiana*.

AGAVES, CACTI, and SUCCULENTS were shown by Hovey & Co., receiving prizes.

GLADIOLI.—This part of the exhibit was perhaps the poorest for many years, owing doubtless to the drought; E. Sheppard was the only contributor.

DAHLIAS were excellent, from John L. Gardner, Francis B. Hayes, C. W. Hoitt, of Nashua, N. H., James Willey, and John Parker.

CUT FLOWERS, considering the unfavorable season, were remarkably good, Mrs. E. M. Gill, Mrs. L. P. Weston, and President Hayes, being the contributors.

One of the most attractive and interesting features of the exhibition, was a collection of *Nymphæas*, *Victoria regia*, and *Nelumbium speciosum* from E. D. Sturtevant of Bordentown, N. J. This exhibit was made at the request of your Committee, and the result fully justified their efforts; the two tanks which Mr. Sturtevant filled with flowers and leaves were constantly surrounded by admiring visitors, and were the special novelties of the display.

Mr. Sturtevant has kindly furnished us with the following detailed account of his method of culture:

“I have a basin in my garden, built of brick and cement, fifty feet by thirty-six, and two and a half deep. I find that in such a basin, the water is more readily warmed by the sun than in a pond with a bottom of natural earth. This extra warmth is of the greatest service in growing the tender *Nymphæas*, and is no detriment whatever to the growth and health of the hardy ones. Soil is not spread over the whole bottom of the basin, but is placed in compartments of cemented brickwork, about ten or twelve inches deep, or in wooden boxes, placed at various intervals. Abundant root room, and room for the spread of the foliage is necessary for the development of fine specimens. Soil from the bed of a pond or river is not at all essential. The compost which I use is simply ordinary garden loam and good horse or cow manure, in nearly equal quantities. The hardy varieties are planted out permanently. Of the tender varieties, such as *Nymphæa Devoniensis*, *N. dentata*, etc., in March or April I take tubers about the size of a hickory nut, pot them in three-inch pots, and place in a tank of water under glass, which is kept steadily at a temperature of about 80°. They soon begin to grow and are shifted perhaps once into larger pots before planting out. Early in June, or as soon as the water is

warm enough for bathing with comfort, the young plants are turned out of the pots into the beds of soil in the basin. No artificial heat whatever was given, after planting out, to the plants which bore the flowers exhibited by me in Boston. Grown in this manner, *N. Devoniensis* and *N. dentata* have produced flowers twelve inches, and leaves twenty-five inches, in diameter, a single specimen covering a space twenty feet across.

No attempt is made to winter very large flowering crowns; they are worthless, and only the small tubers which form around the flowering plant during the growing season are preserved. These ripen off and shed their leaves in autumn, and are placed, a quantity together, in ordinary flower-pots, and covered with clean sand. These pots are placed in tubs or tanks of water in a greenhouse. The tubs are placed in some position where the water is kept at a temperature of 60°. Treated in this manner the bulbs generally remain dormant until spring; though they may be wintered in a lower temperature, I have found 60° the safest. The purple and blue species are increased only by seed. Young plants of these, kept in pots during the summer, will in autumn ripen off into tubers which are wintered in the same manner as the other kinds. The following is a list of those exhibited:

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| <i>Nymphæa alba candidissima,</i> | <i>Nymphæa pygmæa,</i> |
| “ <i>dentata,</i> | “ <i>Zanzibariensis,</i> |
| “ <i>Devoniensis,</i> | “ <i>rubra,</i> |

The leaves and flowers of the *Victoria regia* exhibited, were taken from a plant grown in the open air, with the aid of some artificial heat. It was raised from a seed which germinated about Christmas, 1882. The plant produced its first flower July 20, 1883.

NEW AND DESIRABLE PLANTS. At this Exhibition we had from Messrs. Hovey & Co., a plant of *Ficus elastica aurea* var., a new variety of recent introduction—a form of India-Rubber plant, with pretty golden-edged leaves.

From F. L. Ames, *Nepenthes Mastersiana*, described as a handsome hybrid between *N. sanguinea*, and *N. distillatoria*, the pitchers large, cylindrical, and of a deep red color. Also *Aralia Chabrieri*, an elegant small growing species, with linear leaves of a deep green color, the midrib bright orange.

From H. H. Hunnewell, *Cattleya aurea*, in the way of *C. Dowiana*, but rather lighter in color; and *Osmanthus ilicifolius* var. (Japan

Evergreen Oak). Mr. Hunnewell also exhibited a beautiful assortment of plants, which were not entered for competition in the prize collections.

From David Allan, gardener to R. M. Pratt, *Polypodium plumosum*. The general collection of plants, including Crotons, Ferns, and Lycopods, of Mr. Allan, was one of the most attractive and useful to the horticulturist ever made in our exhibitions, and reflected great credit upon the cultivator.

NATIVE FLOWERS were largely contributed by Mrs. P. D. Richards, E. H. Hitchings, Carrie S. Leeds, Frank H. Forbes and Mrs. G. R. Peckham.

From E. & C. Woodman came a new *Coleus*, Progress.

Miss E. H. Craft and Miss Annie M. Tilley presented designs of dried flowers.

CHRYSANTHEMUM SHOW.

NOVEMBER 8 AND 9.

The opportunity of observing the "Glory Flower" in all its varied hues, was this year far superior to any previous occasions, the collections of plants being larger and finer than ever before.

Dr. H. P. Walcott staged a large and elegant variety, as did also E. W. Wood. Norton Brothers, Marshall P. Wilder, John L. Gardner, and Hovey & Co., furnished excellent plants, but of a smaller size than the first two exhibitors. Cut Chrysanthemums were shown by Edwin Fewkes, H. P. Walcott, the State Lunatic Hospital, at Worcester, and E. W. Wood, to whom were awarded the prizes. Cut blooms were also shown by Mrs. E. M. Gill, Mrs. L. P. Weston, E. Sheppard, W. H. Lincoln, and V. H. Hallock, Son, and Thorpe, of Queens, N. Y.

For six Chrysanthemum plants, Large Flowered varieties, H. P. Walcott was first, with

Empress of India,
Fingal,
Jardin des Plantes,

Lady Hardinge,
Nil Desperandum,
Prince of Wales.

E. W. Wood was second, with

Bouquet Fait,
Elaine,
Fair Maid of Guernsey,

Hiver Fleuri,
Peter the Great,
The Damio.

For four Pompon Chrysanthemums, H. P. Walcott was first, with

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| Curiosity, | Mlle. Marthe, |
| Salamon, | Golden Mlle. Marthe. |

E. W. Wood was second, with

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|----------------|---------------|
| Golden Circle, | Mongolfier, |
| Semiramis, | Mlle. Marthe. |

For a specimen plant, Large Flowered, the first prize was awarded to H. P. Walcott, for Crimson King, and the second to E. W. Wood, for Snowball.

For a specimen plant, Japanese, the first prize to H. P. Walcott, for Triomphe du Châtelet, and the second prize to E. W. Wood, for Elaine.

For a specimen plant, Pompon, the first prize was awarded to E. W. Wood, for Golden Circle, and the second to H. P. Walcott.

For display of plants of all classes, the first prize was given to H. P. Walcott, the second to E. W. Wood, and the third to Norton Brothers.

For twelve cut blooms, Large Flowered or Chinese, the first prize was taken by Edwin Fewkes, with

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|---------------------|------------------|
| Antonelli, | Mabel Ward, |
| Baron Beust, | Pink Perfection, |
| Crimson King, | Prince Victor, |
| George Peabody, | Sunflower, |
| Jardin des Plantes, | Venus, |
| Lord Derby, | White Eve. |

The second prize went to H. P. Walcott, and the third to the State Lunatic Hospital at Worcester.

For six cut blooms, the first prize was awarded to Edwin Fewkes, for

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|-------------------|--------------------|
| Empress of India, | Miss Mary Morgan, |
| Guernsey Nugget, | Prince of Wales, |
| John Salter, | Temple of Solomon. |

The second to H. P. Walcott, for

| | |
|-------------------|-------------------|
| Crimson King, | Lord Wolseley, |
| Empress of India, | Prince Alfred, |
| John Salter, | Queen of England. |

The third prize was awarded to E. W. Wood.

In the display of thirty varieties of Pompon and Japanese cut blooms, H. P. Walcott was first, Edwin Fewkes second, E. W. Wood third, and the State Lunatic Hospital, Worcester, fourth.

Seedling Chrysanthemums were again shown in considerable numbers, grown from American seed, and were remarkably fine. Dr. H. P. Walcott exhibited a number of new varieties in cut blooms, several of them with very noticeable flowers. His seedling, Pontiac, raised two years ago, evidently of the same parentage as the variety President Parkman, which it resembles in habit of growth, foliage, and time of flowering, is very full, of a soft canary color, a profuse and early bloomer, and thus far has resisted mildew in a very marked way.

E. W. Wood also exhibited some very excellent seedlings, grown from seed raised by himself; several of them were equal to some of the kinds now in commerce.

For ORCHIDS, three varieties: the first prize was taken by F. L. Ames, with *Vanda cœrulea*, *Cypripedium Sedeni* and *Odontoglossum Andersoni*, and the second by E. W. Gilmore, with *Oncidium ornythorhynchum*, *Lycaste Skinneri* and *Oncidium Forbesii*.

For a single plant, the first prize went to F. L. Ames for *Cypripedium Harrisianum*, and the second to E. W. Gilmore for *Dendrobium formosum*.

David Allan, gardener to R. M. Pratt, exhibited a beautiful specimen, the finest ever shown here, of that curious plant, *Ouviranda fenestralis*, the Lace or Skeleton plant, for a description of which see "Curtis's Botanical Magazine," Vol. 82, plate 4894. Mr. Allan also presented a very beautiful and rare collection of cut flowers.

F. L. Ames supplied a miscellaneous collection of orchids and cut flowers.

MISCELLANEOUS EXHIBITS.

Camellias were shown by President Francis B. Hayes, for several weeks in succession, of finer quality than ever before.

January 2d, W. C. Page exhibited a seedling Carnation, called Victor; color, bright crimson pink, striped, edges serrated, fragrant.

February 17th, several seedling Carnations were shown by Sewall Fisher, viz. :

Fisher's Early White, raised in 1878, from pistillate parent, Degraw ; very early, pure white, very fragrant, and with no indication of bursting.

Anna Webb, a large flower of deep crimson-maroon color, serrated edges ; very fragrant, does not burst.

Dana, bright pink color, not large.

Jessie Lee, a large flower, white edges striped with pink, bursts.

Maria, color, rosy white, striped with dark pink, some of the petals clear rose.

Marion, a seedling of 1882 ; pistillate parent, Early White ; staminate parent, Cardinal ; color, creamy white, the edges of the petals delicately pencilled with deep pink lines ; no indications of bursting in the flower.

Shawmut, a seedling of 1882 ; staminate parent, Astoria ; ground color pale yellow, edges flecked with red.

Mr. Fisher has entered his seedling carnation, Fisher's Early White, for the Prospective Prize for a seedling flowering plant. Your Committee at the invitation of Mr. Fisher, visited his establishment at Framingham Centre, in December, 1882, when they saw this carnation growing in perfection, together with other seedlings. Mr. Fisher claims for it earliness and productiveness, and under his culture it fully justified the claim ; the plants looked healthy, and were full of buds and flowers ; the beds were mulched with tobacco stems, which seems to be an excellent system for promoting the health of the plants. As this variety is in the hands of several cultivators, the Committee prefer to wait another year, before recommending any further award.

April 9th, V. H. Hallock, Son, & Thorpe of Queens, N. Y., sent a large collection of seedling carnations which reached the rooms too late for the meeting of the Committee. The collection contained some very good varieties ; the flowers were considerably wilted before the Chairman saw them, but the following varieties seemed the most noticeable :

Black Knight, very dark.

Charles Henderson, bright pink, fringed.

Cymbeline, bright lemon, bordered and flaked orange.

Fairy, white, beautifully scalloped purple.

Jeanette, pure white.

Mrs. A. Rolker, delicate rose, fringed.

Petunia, white, bordered and flaked purple.

President Wilder, very dark maroon, fringed.

Robert Manning, scarlet.

Valentine, white, deeply flaked and edged pink.

February 18th, H. H. Hunnewell exhibited a magnificent collection of cut Orchids in variety; the finest display ever made before the Society. The same day came from President Hayes an excellent specimen of the beautiful *Clianthus Dampieri*, and from John L. Gardner a bunch of fifty flowers of the charming violet Marie Louise, the finest samples of this variety that we have ever seen, being immense double flowers.

March 3d, Edward L. Beard presented an admirable group of Hyacinths, Lily of the Valley, and Narcissus; and again on the 10th, a fine collection. Hon. Marshall P. Wilder exhibited Azaleas in bloom, two years from the seed.

March 31st, from F. L. Ames came a collection of cut Orchids excelling anything of the kind he has ever before shown.

During the early spring months, John B. Moore & Son and William C. Strong were frequent exhibitors of Hybrid Perpetual Roses, making larger and more frequent displays than ever before.

April 7th, Edwin Fewkes placed upon the tables two new heliotropes, Swanley Giant—very large, and White Lady.

April 14th, from Woolson & Co., Passaic, N. J., came *Primula Sieboldii* in variety, Narcissus, and *Chionodoxa Lucilice*, or Glory of the Snow.

April 21st, Marshall P. Wilder sent Azalea Mme. Charles Van Eeckhaute, color, pure white, crisped petals.

July 7th, Francis Parkman exhibited a beautiful and striking collection of Venetian Poppies in various colors.

July 14th, Dr. H. P. Walcott presented a group of Delphiniums, which have never been excelled, if equalled; the flower spikes were large, full and perfect in form.

August 11th, William H. Spooner placed on the table a seedling Gladiolus, No. 500; in color, the three or sometimes four or five lower divisions bright lemon shading to white, tipped scarlet; the other divisions rosy carmine to scarlet, a white line running through each petal; full spike, strong grower. Also No. 501, a

cross between Diamond and Richard Cœur de Lion; color, pale rose, profusely striped with carmine pink, a white stripe extending through the centre of each of the upper divisions; purple throat, similar to Richard Cœur de Lion; lower divisions deep carmine pink; a strong grower.

Notwithstanding the excessively dry weather of the season, the exhibition of Gladioli was much finer in prize varieties than for several years. Those of Mrs. T. L. Nelson and O. B. Hadwen, of Worcester, were remarkably good, as were also those of F. Bacheller, of Lynn.

Messrs. C. L. Allen & Co., of Queens, N. Y., presented a very good variety of Seedling Gladioli, three varieties of which they had named Martha Washington, Emma Thursby, and Bayard Taylor.

The general display of miscellaneous flowers was one of the best of the season. President Hayes contributed a choice collection of Hybrid Perpetual Roses, Dahlias, etc., Warren Heustis about two dozen very excellent specimens of the same; and Edwin Fewkes, fine roses. Ex-President J. F. C. Hyde, presented a group of his beautiful Gladiolus, Hyde's White; James Cartwright exhibited fine seedling Gladioli; from Mrs. L. P. Weston came a large collection of cut flowers, and from E. L. Beard a small number of flowers of his excellent strain of seedling Tuberous Rooted Begonias. O. B. Hadwen was awarded the prize for a single spike of Gladiolus, the variety being Baroness Burdett-Coutts.

F. Bacheller was first for ten spikes, with

| | |
|--------------------------|-------------|
| Andromeda, | Jupiter, |
| Arabi Pasha, | Leander, |
| Baroness Burdett-Coutts, | Marie, |
| Beatrix, | Meyerbeer, |
| Carnation, | Parmentier. |

In Phlox Drummondi, Mrs. T. L. Nelson was first with an admirable collection in well assorted varieties. President Hayes contributed the variety *Violacea*, of very deep color. From John C. Hovey, came *Montbretia crocosmæflora*.

August 25th, Asters were shown, which were remarkably good considering the dry weather, by E. Sheppard, John L. Gardner, Francis B. Hayes, James Nugent, M. B. Faxon, and Mrs. E. M. Gill.

From R. T. Jackson came *Campanula rotundifolia* var. *alba*, with a small white flower, collected at Trenton Falls, N. Y.

September 1st, the display of *Lilium lancifolium* and *Tropæolums*, was very meagre — the poorest for many years. In Single Dahlias, there was no competition for the prizes. Marigolds were of inferior quality.

Mrs. P. D. Richards presented a collection of twelve species of *Solidago* (Golden Rod), viz. :

S. altissima,
 “ *arguta*,
 “ *bicolor*,
 “ *Canadensis*,
 “ *lanceolata*,
 “ *latifolia*,

S. neglecta,
 “ *nemoralis*,
 “ *odora*,
 “ *puberula*,
 “ *sempervirens*,
 “ *serotina*.

September 8th, the exhibit of Double Zinnias was much larger than for several years, seven collections competing for the prizes. The first was awarded to Mrs. William Latham, the second to Hovey & Co., and the third to H. B. Watts.

Dianthus were also more extensively shown, and in finer assortments of colors; there were five competitors in this class, the first prize being given to E. Sheppard, the second to Mrs. Austin W. Ward, and the third to H. B. Watts.

September 20, President Hayes exhibited a single bloom of the new rose, White Baroness; color pure white, form like that of its parent, Baroness Rothschild.

The prizes for Herbaceous Plants have not attracted as much competitive interest as was hoped. Mrs. L. P. Weston has been the only continuous exhibitor through the season; her contributions have been excellent, instructive, and carefully named; lists of the varieties were furnished the Committee from week to week, and to her was awarded a Silver Medal for the greatest number of first prizes during the season, for Herbaceous Plants.

Prizes have been awarded from the Hunnewell fund to the amount of \$70.00. The special appropriation of \$100.00 for winter exhibits has all been awarded.

The amount of money prizes and gratuities awarded is \$1,499, out of the appropriation of \$1,500.

All of which is respectfully submitted.

| | | |
|-------------------|---|---|
| WM. H. SPOONER, | } | <i>Committee on Plants and Flowers.</i> |
| JOS. H. WOODFORD, | | |
| JAMES CARTWRIGHT, | | |
| DAVID ALLAN, | | |
| F. L. HARRIS, | | |
| E. L. BEARD, | | |

PRIZES AND GRATUITIES AWARDED FOR PLANTS
AND FLOWERS.

JANUARY 6.

Gratuities :—

| | |
|--|--------|
| Mrs. C. N. S. Horner, Cut Flowers, | \$1 00 |
| Mrs. E. M. Gill, " " | 1 00 |
| Miss S. W. Story, " " | 1 00 |

JANUARY 13.

Gratuities :—

| | |
|---|------|
| Francis B. Hayes, Camellias, | 1 00 |
| Mrs. E. M. Gill, Cut Flowers, | 1 00 |

JANUARY 20.

Gratuities :—

| | |
|--|------|
| Francis B. Hayes, Camellias, | 3 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |
| Mrs. E. M. Gill, " " | 1 00 |

JANUARY 27.

Gratuities :—

| | |
|--|------|
| James Cartwright, <i>Cypripedium insigne</i> , | 2 00 |
| Francis B. Hayes, Camellias, | 1 00 |
| Mrs. E. M. Gill, Cut Flowers, | 1 00 |

FEBRUARY 3.

Gratuities :—

| | |
|---|------|
| Francis B. Hayes, Camellias, | 2 00 |
| Jackson Dawson, Gen. Jacqueminot Roses, | 1 00 |

FEBRUARY 10.

Gratuities :—

| | |
|--|------|
| Francis B. Hayes, Camellias, | 2 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |
| Mrs. A. D. Wood, " " | 1 00 |

FEBRUARY 17.

Gratuities :—

| | |
|--|-------|
| H. H. Hunnewell, Cut Orchids, | 10 00 |
| William C. Strong, Gen. Jacqueminot Roses, | 2 00 |
| Jackson Dawson, English Primulas, | 2 00 |
| Hovey & Co., Camellias, | 2 00 |
| Mrs. E. M. Gill, Cut Flowers, | 1 00 |
| Miss S. W. Story, " " | 1 00 |

PRIZES AND GRATUITIES FOR PLANTS AND FLOWERS. 235

FEBRUARY 24.

Gratuities :—

| | |
|--|--------|
| Francis B. Hayes, Camellias, | \$2 00 |
| Hovey & Co., " | 2 00 |
| William C. Strong, Hybrid Perpetual Roses, | 1 00 |
| W. K. Wood, <i>Freesia refracta alba odorata</i> , | 1 00 |
| John L. Gardner, Violets in pots, | 1 00 |
| Mrs. E. M. Gill, Cut Flowers, | 1 00 |
| Miss S. W. Story, " " | 1 00 |

MARCH 3.

Gratuities :—

| | |
|---|------|
| Edward L. Beard, Hyacinths, Lily of the Valley, etc., | 4 00 |
| James Cartwright, Cyclamen, | 2 00 |
| Francis B. Hayes, Camellias, | 3 00 |
| Hovey & Co., " | 2 00 |
| John L. Gardner, Marie Louise Violets, | 1 00 |
| John B. Moore & Son, Hybrid Perpetual Roses, | 1 00 |
| William C. Strong, " " " | 1 00 |
| Mrs. E. M. Gill, Cut Flowers, | 1 00 |
| Miss S. W. Story, " " | 1 00 |

MARCH 10.

Gratuities :—

| | |
|--|------|
| Francis B. Hayes, Camellias, Roses, etc., | 4 00 |
| Hovey & Co., Camellias, | 2 00 |
| " " <i>Andromeda Japonica</i> , | 1 00 |
| Edward L. Beard, Hyacinths and Tulips, | 3 00 |
| William C. Strong, Hybrid Perpetual Roses, | 2 00 |
| Benjamin G. Smith, Gloxinias and Begonias, | 1 00 |
| " " " Seedling Abutilon, | 1 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |
| Mrs. E. M. Gill, " " | 1 00 |

MARCH 17.

Gratuities :—

| | |
|--|------|
| William C. Strong, Hybrid Perpetual Roses, | 2 00 |
| Francis B Hayes, Camellias and Roses, | 2 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |

AZALEA AND ROSE SHOW.

MARCH 22.

| | |
|---|---------|
| INDIAN AZALEAS.—Six named varieties, in pots, Marshall P. Wilder, | \$12 00 |
| Two named varieties, in pots, Marshall P. Wilder, | 8 00 |
| Specimen plant, named, in pot, John L. Gardner, | 5 00 |

| | |
|--|--------|
| INDIAN AZALEAS.—Four named varieties, in not exceeding ten-inch pots, Marshall P. Wilder, | \$8 00 |
| Second, Marshall P. Wilder, | 6 00 |
| Single plant, of any named variety, in not exceeding an eight-inch pot, Marshall P. Wilder. | 3 00 |
| Second, Marshall P. Wilder, | 2 00 |
| HYBRID PERPETUAL ROSES.—Three plants, in not over eight-inch pots, distinct named varieties, Francis B. Hayes, | 6 00 |
| Second, John B. Moore & Son, | 5 00 |
| Twelve cut blooms, of six distinct named varieties, two of each, John B. Moore & Son, | 6 00 |
| Second, William C. Strong, | 4 00 |
| Six blooms, of four distinct named varieties, John B. Moore & Son, | 3 00 |
| Second, John B. Moore & Son, | 2 00 |
| Single bloom, of any named variety, Francis B. Hayes, Baroness Rothschild, | 1 00 |
| TENDER ROSES.—Twelve blooms of Maréchal Niel, E. M. Wood & Co., | 3 00 |
| ORCHIDS.—Three plants, in bloom, H. H. Hunnewell, | 8 00 |
| Single plant in bloom, H. H. Hunnewell, <i>Odontoglossum Insleayi</i> , | 3 00 |
| Second, Francis B. Hayes, <i>Dendrobium nobile</i> , | 2 00 |
| GREENHOUSE PLANTS.—Specimen, in bloom, other than Azalea or Orchid, named, H. H. Hunnewell, <i>Chorozema varia</i> , | 5 00 |
| Second, John L. Gardner, <i>Imantophyllum miniatum</i> , | 4 00 |
| HEATH.—Single plant, in bloom, Francis B. Hayes, | 3 00 |
| Second, John L. Gardner, | 2 00 |
| PRIMULAS.—Three plants, Single Flowered, of distinct varieties, in bloom, John L. Gardner, | 2 00 |
| CINERARIAS.—Four varieties, in not over nine-inch pots, in bloom, William Patterson, | 4 00 |
| Single plant, in bloom, William Patterson, | 2 00 |
| VIOLETS.—Six plants, in bloom, William Patterson, | 2 00 |
| Second, John L. Gardner, | 1 00 |
| HYACINTHS.—Twelve distinct named varieties, in pots, one in each pot, John L. Gardner, | 5 00 |
| Six bulbs, in pots, distinct named varieties, one in each pot, John L. Gardner, | 4 00 |
| Single named bulb, in pot, in bloom, John L. Gardner, | 2 00 |
| NARCISSUS.—Four six-inch pots, two bulbs in each, in bloom, John L. Gardner, | 3 00 |
| JONQUILS.—Four six-inch pots, six bulbs in each, in bloom, John L. Gardner, | 3 00 |
| CAMELLIAS.—Display of named varieties, cut flowers with foliage, not less than twenty blooms, Francis B. Hayes, | 4 00 |
| Second, Hovey & Co., | 3 00 |
| Six cut blooms, of six named varieties, with foliage, Hovey & Co., | 3 00 |
| Second, Francis B. Hayes, | 2 00 |

PRIZES AND GRATUITIES FOR PLANTS AND FLOWERS. 237

| | |
|--|--------|
| CUT FLOWERS.—Display, filling fifty bottles, W. K. Wood, | \$3 00 |
| Second, Miss S. W. Story, | 2 00 |
| HAND BOUQUETS.—Pair, Hovey & Co., | 3 00 |
| Second, James Nugent, | 2 00 |
| BASKET OF FLOWERS.—Best arranged, Mrs. E. M. Gill, | 4 00 |

Gratuities:—

| | |
|--|-------|
| Marshall P. Wilder, Collection of Azaleas, | 12 00 |
| E. M. Wood & Co., Cut Roses, | 10 00 |
| John L. Gardner, Hybrid Perpetual Roses, | 1 00 |
| “ “ “ Polyanthus and Epacris, | 3 00 |
| Francis B. Hayes, Collection of Plants, | 10 00 |
| D. Zirngiebel, Pansies, | 1 00 |
| E. Sheppard, “ | 1 00 |
| Henry R. Comley, Carnations and Bouvardias, | 2 00 |
| H. H. Hunnewell, <i>Chorozema Henchmanni</i> , | 2 00 |
| Benjamin G. Smith, Gloxinias, | 1 00 |
| Edwin Fewkes, Cut Flowers, | 2 00 |
| James Nugent, “ “ | 1 00 |

MARCH 31.

Gratuities:—

| | |
|--|-------|
| F. L. Ames, Orchids, | 12 00 |
| John B. Moore & Son, Hybrid Perpetual Roses, | 2 00 |
| William C. Strong, “ “ “ | 1 00 |
| Hovey & Co., Camellias, etc., | 2 00 |
| Francis B. Hayes, Cut Flowers, | 3 00 |
| Mrs. A. D. Wood, “ “ | 1 00 |
| Miss S. W. Story, “ “ | 1 00 |
| Miss E. M. Gill, “ “ | 1 00 |

APRIL 7.

Gratuities:—

| | |
|---|------|
| John B. Moore & Son, Hybrid Perpetual Roses, | 2 00 |
| Hovey & Co., Camellias, | 2 00 |
| Edwin Fewkes, New Heliotropes, | 2 00 |
| Marshall P. Wilder, Azaleas, | 2 00 |
| John L. Gardner, <i>Anthurium Scherzerianum</i> and <i>Dendrobium chrysotoxum</i> , | 2 00 |
| E. Sheppard, Rhododendrons and Pelargoniums, | 1 00 |
| Francis B. Hayes, Cut Flowers, | 3 00 |
| Miss E. M. Gill, “ “ | 1 00 |
| Miss S. W. Story, “ “ | 1 00 |

APRIL 14.

Gratuities:—

| | |
|--|------|
| E. Sheppard, <i>Dendrobium Devonianum thyrsiflorum</i> , | 3 00 |
| Francis B. Hayes, <i>Franciscea eximia</i> , Azaleas, and other flowers, | 3 00 |

| | |
|--|--------|
| Woolson & Co., Passaic, N. J., <i>Primula Sieboldii</i> in variety, Narcissus, and Chionodoxa, | \$2 00 |
| Hovey & Co., Camellias, | 2 00 |
| Edward L. Beard, Pansies, Anemone, and Polyanthus, | 1 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |
| Mrs. A. D. Wood, " " | 1 00 |
| Mrs. E. M. Gill, " " | 1 00 |

APRIL 21.

Gratuities:—

| | |
|---|------|
| Edward L. Beard, Lily of the Valley, in pots, | 2 00 |
| E. Sheppard, Pelargoniums and Azaleas, | 1 00 |
| Joseph Tailby, <i>Cypripedium villosum</i> , | 1 00 |
| Marshall P. Wilder, Azalea Mme. Charles Van Eckhaute, | 1 00 |
| Mrs. L. P. Weston, Cut Flowers, | 1 00 |
| Mrs. E. M. Gill, " " | 1 00 |
| Miss S. W. Story, " " | 1 00 |
| Mrs. A. D. Wood, " " | 1 00 |

APRIL 28.

Gratuities:—

| | |
|---|------|
| Edward L. Beard, Pansies, | 1 00 |
| Mrs. A. D. Wood, Cut Flowers, | 1 00 |

MAY 5.

Gratuities:—

| | |
|---|------|
| Francis B. Hayes, <i>Erica speciosa</i> , | 1 00 |
| " " Cut Flowers, | 1 00 |
| Mrs. E. M. Gill, " " | 1 00 |
| Miss S. W. Story, " " | 1 00 |
| W. H. Badlam, " " | 1 00 |

PELARGONIUM EXHIBITION.

MAY 12.

| | |
|--|--------|
| INDIAN AZALEAS.—Single plant in pot, named, John L. Gardner, | \$6 00 |
| Second, Marshall P. Wilder, | 5 00 |
| Third, " " | 4 00 |
| TULIPS.—Twenty-four blooms, distinct named varieties, John L. Gardner, | 4 00 |
| Second, John L. Gardner, | 3 00 |
| HYACINTHS.—Twenty of different colors, Miss E. M. Harris, | 5 00 |
| TABLE DESIGN, other than a Basket of Flowers, Mrs. E. M. Gill, | 4 00 |
| Second, Miss S. W. Story, | 3 00 |
| HERBACEOUS PLANTS.—Largest and best arranged collection, correctly named, J. W. Manning, | 2 00 |

PRIZES AND GRATUITIES FOR PLANTS AND FLOWERS. 239

Gratuities :—

| | |
|--|--------|
| William A. Bock, Pelargoniums, | \$2 00 |
| E. Sheppard, " | 2 00 |
| " " Fancy " | 1 00 |
| Dr. H. C. Meriam, <i>Caltha palustris fl. pl.</i> , and Pansies, | 1 00 |
| W. H. Badlam, Primulas and Anemones, | 1 00 |
| Miss L. P. Weston, Cut Flowers, | 1 00 |
| Mrs. A. D. Wood, " " | 1 00 |

MAY 19.

Gratuities :—

| | |
|---|------|
| Marshall P. Wilder, Azaleas, | 2 00 |
| E. Sheppard, <i>Cattleya Mossiæ</i> , | 2 00 |
| John C. Hovey, Narcissus, | 2 00 |
| Miss Anna C. Kenrick, Magnolias, | 1 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |
| Mrs. E. M. Gill, " " | 1 00 |

MAY 26.

Gratuities :—

| | |
|--|------|
| Hovey & Co., Plants and Flowers, | 2 00 |
| E. L. Beard, Primulas, Ranunculus, and Anemones, | 1 00 |
| Mrs. E. S. Joyce, Cut Flowers, | 1 00 |
| Mrs. E. M. Gill, " " | 1 00 |
| E. H. Hitchings, Native Flowers, | 1 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |

RHODODENDRON SHOW.

JUNE 9.

| | |
|--|--------|
| TREE PÆONIES.—Six named varieties, Marshall P. Wilder, | \$3 00 |
| GERMAN IRIS.—Twelve distinct varieties, Francis B. Hayes, | 3 00 |
| CUT FLOWERS.—Display, filling 100 bottles, W. K. Wood, | 4 00 |
| Second, Mrs. E. M. Gill, | 3 00 |
| Third, Miss S. W. Story, | 2 00 |
| NATIVE PLANTS.—Display of named species and varieties, one bottle each, E. H. Hitchings, | 3 00 |
| CLEMATIS.—Early named varieties, display of cut blooms, Joseph H. Woodford, | 3 00 |
| Second, John B. Moore & Son, | 2 00 |
| TABLE DESIGN, other than a basket of flowers, Miss S. W. Story, | 4 00 |
| Second, Mrs. E. M. Gill, | 3 00 |

Gratuities :—

| | |
|---|-------|
| H. H. Hunnewell, Rhododendrons and Azaleas, | 10 00 |
| Francis B. Hayes, " | 8 00 |
| Hovey & Co., " and Azaleas, | 3 00 |

| | |
|--|--------|
| Francis Parkman, Seedling Ghent Azaleas, | \$1 00 |
| Benjamin G. Smith, Rhododendrons, Azaleas, and Clematis, | 1 00 |
| Jackson Dawson, Seedling " | 2 00 |
| " " Rare Shrubs, | 2 00 |
| James Cartwright, <i>Lalia purpurata</i> , | 2 00 |

JUNE 13.

Postponement of Award of Hunnewell Prizes.

| | | |
|--|--|-------|
| RHODODENDRONS.—Twenty-five tender varieties, named, Francis B. Hayes, | | 10 00 |
| Twelve tender varieties, named, Francis B. Hayes, | | 6 00 |
| Second, " " " | | 4 00 |
| Six tender varieties, named, " " " | | 3 00 |
| Three tender varieties, named. " " " | | 2 00 |
| Single truss of any tender variety, named, Francis B. Hayes, for Duchess of Bedford, | | 1 00 |
| Eighteen hardy varieties, named, John L. Gardner, | | 10 00 |
| Second, Hovey & Co., | | 6 00 |
| Ten hardy varieties, named, Francis B. Hayes, | | 6 00 |
| HARDY AZALEAS.—Any or all classes, fifteen named varieties, one truss each, E. Sheppard, | | 8 00 |

Gratuities:—

| | |
|---|------|
| H. H. Hunnewell, Rhododendrons and Azaleas, | 3 00 |
| Francis B. Hayes, " | 6 00 |
| " " " <i>Erica ampullacea Barnsii</i> , | 2 00 |
| Hovey & Co., Pæonies and Rhododendrons, | 4 00 |
| E. Sheppard, Azaleas and " | 1 00 |
| John B. Moore & Son, Clematis and Pæonies, | 1 00 |
| George Craft, Cut Flowers, | 1 00 |

JUNE 16.

Gratuities:—

| | |
|---|------|
| Francis B. Hayes, Rhododendrons, Roses, and Clematis, | 3 00 |
| William H. Spooner, Hybrid Perpetual Roses, | 2 00 |
| Benjamin G. Smith, " " " | 1 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |
| Mrs. E. M. Gill, " " | 1 00 |

ROSE AND STRAWBERRY EXHIBITION.

JUNE 26.

Special Subscription Prizes.

| | |
|--|---------|
| HYBRID PERPETUAL ROSES.—Twenty-four Roses, of different varieties, named, John L. Gardner, Silver Vase, value, | \$50 00 |
|--|---------|

PRIZES AND GRATUITIES FOR PLANTS AND FLOWERS. 241

| | |
|--|---------|
| Three Roses of different varieties, named, Warren Heustis, Silver Vase, value, | \$15 00 |
| Six Roses of different varieties, named, John S. Richards, Silver Vase, value, | 25 00 |
| Three Roses of one variety, John L. Gardner, for Abel Carrière, Silver Vase, value, | 15 00 |
| Six Roses of one variety, Francis Skinner, Jr., for Charles Lefebvre, Silver Vase, value, | 25 00 |
| Twenty-four varieties, three specimens of each, to John B. Moore & Son, to be held for three consecutive years, this being the second year of the award, Silver Challenge Vase, value, | 200 00 |

Society's Special Prizes.

| | | |
|---|--|------|
| HYBRID PERPETUAL ROSES.—Six blooms of Alfred Colomb, John B. Moore & Son, | | 4 00 |
| Six blooms of Baroness Rothschild, Francis B. Hayes, | | 4 00 |
| Six blooms of Mme. Gabriel Luizet, John L. Gardner | | 4 00 |
| Six blooms of Mme. Victor Verdier, John B. Moore & Son, | | 4 00 |
| Six blooms of Mons. Boncenne, Francis B Hayes, | | 4 00 |

Regular Prizes.

| | | |
|--|--|-------|
| HYBRID PERPETUAL ROSES. — Twenty-four distinct named varieties, two of each variety, John B. Moore & Son, | | 12 00 |
| Second, Warren Heustis, | | 10 00 |
| Twelve distinct named varieties, John S. Richards, | | 8 00 |
| Second, John L. Gardner, | | 6 00 |
| Third, Benjamin G. Smith, | | 4 00 |
| Six distinct named varieties, John S. Richards, | | 4 00 |
| Second, Francis B. Hayes, | | 3 00 |
| Third, John L. Gardner, | | 2 00 |
| MOSS ROSES.—Six named varieties, three clusters of each, John B. Moore & Son, | | 4 00 |
| Three named varieties, three clusters of each, William H. Spooner, Second, John B. Moore & Son, | | 3 00 |
| TEA AND BOURBON ROSES.—Twelve cut blooms, named, Mrs. E. M. Gill, | | 3 00 |
| GENERAL DISPLAY, of one hundred bottles of Hardy Roses, Norton Brothers, | | 7 00 |
| Second, John S. Richards, | | 6 00 |
| Third, John B. Moore & Son. | | 5 00 |
| Fourth, Francis B. Hayes, | | 4 00 |
| Fifth, William H. Spooner, | | 3 00 |
| STOVE AND GREENHOUSE FLOWERING PLANTS, no Orchid admissible.—Six distinct named varieties, in bloom, John L. Gardner, Second, Hovey & Co., | | 8 00 |
| SPECIMEN PLANT, in bloom, other than Orchid, named, regard being had to new and rare varieties, John L. Gardner, | | 4 00 |

| | |
|---|--------|
| ORCHIDS.—Three named varieties, in bloom, F. L. Ames, | \$6 00 |
| Second, Robert M. Pratt, | 5 00 |
| Single plant, H. H. Hunnewell, for <i>Odontoglossum vexillarium</i> , | 3 00 |
| SWEET WILLIAMS.—Thirty trusses, not less than six distinct varieties, | |
| E. Sheppard, | 3 00 |
| Second, Hovey & Co., | 2 00 |
| VASE OF FLOWERS.—Best arranged, in one of the Society's glass | |
| vases, Mrs. E. M. Gill, | 4 00 |
| Second, Miss S. W. Story, | 3 00 |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | 2 00 |

Gratuities :—

| | |
|---|-------|
| F. L. Ames, Orchids, | 10 00 |
| “ “ <i>Ixora Williamsii</i> , | 2 00 |
| Robert M. Pratt, Plants and Cut Flowers, | 5 00 |
| John C. Hovey, Herbaceous Pæonies, | 3 00 |
| Francis B. Hayes, <i>Yucca variegata</i> , | 2 00 |
| “ “ “ <i>Clematis</i> , | 1 00 |
| A. P. Calder, <i>Nymphaea</i> var., | 1 00 |
| C. J. Power, Collection of Plants, grown in moss, | 2 00 |
| J. W. Manning, Evergreens, | 2 00 |
| E. Sheppard, Cut Flowers, | 2 00 |
| Mrs. L. P. Weston, “ “ | 2 00 |
| Miss S. W. Story, “ “ | 2 00 |
| Mrs. E. M. Gill, “ “ | 2 00 |
| E. H. Hitchings, <i>Kalmia latifolia</i> , | 1 00 |
| Frank H. Forbes, Wild Roses, | 1 00 |

JUNE 30.

Gratuities :—

| | |
|--|------|
| Hovey & Co., Rhododendrons, | 2 00 |
| Jackson Dawson, Shrubs, | 1 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |
| Mrs. E. M. Gill, “ “ | 1 00 |

JULY 7.

| | |
|--|------|
| HYBRID PERPETUAL ROSES.—Twenty-four blooms, of twenty-four | |
| distinct named varieties, in vases, John B. Moore & Son, | 4 00 |
| Second, William H. Spooner, | 3 00 |
| DELPHINIUMS.—Six named varieties, Benjamin G. Smith, | 3 00 |
| Second, E. Sheppard, | 2 00 |
| CUT FLOWERS.—Display, filling one hundred bottles, W. K. Wood, | 4 00 |
| Second, Mrs. E. M. Gill, | 3 00 |
| Third, Mrs. L. P. Weston, | 2 00 |
| TABLE DESIGN.—Best arranged, Mrs. E. M. Gill, | 3 00 |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | 2 00 |

PRIZES AND GRATUITIES FOR PLANTS AND FLOWERS. 243

Gratuities :—

| | |
|---|--------|
| Benjamin G. Smith, Delphiniums, | \$1 00 |
| Miss E. M. Harris, Lilies, | 1 00 |
| James Nugent, Sweet Peas, | 1 00 |
| Miss S. W. Story, Cut Flowers, | 2 00 |
| Hovey & Co., " " | 2 00 |
| E. H. Hitchings, Wild " | 2 00 |

JULY 14.

| | |
|--|------|
| GLOXINIAS.—Six distinct varieties, in pots, Edward L. Beard, | 5 00 |
| VASE OF FLOWERS.—Best arranged, in one of the Society's glass vases, W. K. Wood, | 3 00 |
| Second, Miss S. W. Story, | 2 00 |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | 2 00 |
| Second, A. McLaren, | 1 00 |

Gratuities :—

| | |
|---|------|
| Miss E. M. Harris, Hollyhocks, | 2 00 |
| E. L. Beard, Dahlias and Gloxinias, | 2 00 |
| Edwin Fewkes, Iris, Dahlias, etc, | 1 00 |
| John L. Gardner, <i>Erica juliana</i> , | 2 00 |
| John Robinson, <i>Tamarix Chinensis</i> , | 1 00 |
| Mrs L. P. Weston, <i>Asclepias tuberosa</i> , | 1 00 |
| James Nugent, <i>Lilium longiflorum</i> , | 1 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |
| Mrs. L. P. Weston, " " | 2 00 |
| Mrs. E. M. Gill, " " | 1 00 |
| Mrs. A. D. Wood, Basket of Flowers, | 1 00 |
| Mrs. A. J. Dolbear, Native Flowers, | 2 00 |

JULY 21.

| | |
|---|------|
| HOLYHOCKS.—Twelve blooms, of twelve distinct colors, E. Sheppard, | 4 00 |
| Second, John L. Gardner, | 3 00 |
| Six blooms, of six distinct colors, Miss E. M. Harris, | 2 00 |
| Three blooms, of three distinct colors, Mrs. E. M. Gill, | 1 00 |
| CUT FLOWERS. — Display, filling one hundred bottles, W. K. Wood, | 4 00 |
| Second, Mrs. E. M. Gill, | 3 00 |
| Third, Mrs. L. P. Weston, | 2 00 |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | 2 00 |

Gratuities :—

| | |
|--|------|
| Jonas H. French, Orchids, | 3 00 |
| Hovey & Co., <i>Lilium Batemanni</i> and <i>L. Hoveyii</i> , | 1 00 |
| Miss E. M. Harris, Hollyhocks, | 2 00 |
| Mrs. E. M. Gill " | 1 00 |
| E. Sheppard, Phloxes, | 1 00 |
| James Nugent, Cut Flowers, | 2 00 |
| Miss S. W. Story, " " | 2 00 |

JULY 28.

| | |
|--|--------|
| HYDRANGEAS.—Three plants of different varieties, in pots, the second prize to C. H. Hovey, | \$3 00 |
| PELARGONIUMS.—Six double and single varieties, named, the second prize to Mrs. E. M. Gill, | 1 00 |
| PERENNIAL PHLOXES.—Six distinct named varieties, one spike each, E. Sheppard, | 3 00 |
| SWEET PEAS.—Display, filling twenty-five bottles, James Nugent, | 3 00 |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | 2 00 |

Gratuities :—

| | |
|--|------|
| E. Sheppard, Phloxes and Hollyhocks, | 2 00 |
| Hovey & Co., Hydrangeas, | 2 00 |
| E. L. Beard, Tuberous Rooted Begonias, | 1 00 |
| Francis B. Hayes, Cut Flowers, | 3 00 |
| Mrs. L. P. Weston, “ “ | 2 00 |
| Mrs. E. M. Gill, “ “ | 2 00 |
| Miss S. W. Story, “ “ | 2 00 |
| Hovey & Co., “ “ | 1 00 |
| Mrs. A. D. Wood, Basket of Flowers, | 1 00 |
| W. K. Wood, Vase of Flowers, | 1 00 |
| Mrs. P. D. Richards, Native Plants, | 1 00 |

AUGUST 4.

| | |
|---|------|
| HYBRID PERPETUAL ROSES.—Twelve blooms, of twelve distinct named kinds, John B. Moore & Son, | 3 00 |
| Second, John B. Moore & Son, | 2 00 |
| STOCKS.—Six varieties, one cut plant of each, William Patterson, | 2 00 |
| BALSAMS.—Twelve spikes, not less than eight varieties, E. Sheppard, | 2 00 |
| CUT FLOWERS.—Display filling one hundred bottles, Francis B. Hayes, | 4 00 |
| Second, W. K. Wood, | 3 00 |
| Third, Mrs. E. M. Gill, | 2 00 |
| VASE OF FLOWERS.—The second prize to Mrs. A. D. Wood, | 1 00 |
| NATIVE FERNS.—Display, Mrs. P. D. Richards, | 3 00 |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | 2 00 |

Gratuities :—

| | |
|--|------|
| John B. Moore & Son, Hybrid Perpetual Roses, | 1 00 |
| Francis B. Hayes, Petunias, | 1 00 |
| E. Sheppard, Dianthus and Dahlias, | 1 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |
| Edwin Fewkes, “ “ | 1 00 |

AUGUST 11.

| | |
|---|------|
| PERENNIAL PHLOXES.—Ten distinct named varieties, one spike each, John B. Moore & Son, | 3 00 |
| Second, E. Sheppard, | 2 00 |

PRIZES AND GRATUITIES FOR PLANTS AND FLOWERS. 245

| | |
|---|--------|
| PETUNIAS—Collection, filling thirty bottles, one spray in each, | |
| Francis B. Hayes, | \$3 00 |
| Second, James Nugent, | 2 00 |
| Third, Mrs. E. M. Gill, | 1 00 |
| CUT FLOWERS.—Display, filling one hundred bottles, Francis B. | |
| Hayes, | 4 00 |
| Second, Mrs. E. M. Gill, | 3 00 |
| Third, W. K. Wood, | 2 00 |
| NATIVE FLOWERS.—Collection, Mrs. A. J. Dolbear, | |
| Second, E. H. Hitchings, | 2 00 |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | |
| | 2 00 |

Gratuities:—

| | |
|---|------|
| Francis B. Hayes, Roses, Asters, etc., | 2 00 |
| E. Sheppard, Phlox, Hollyhocks, and Petunias, | 2 00 |
| Joseph G. Coolidge, Petunias, | 1 00 |
| Mrs. L. P. Weston, Cut Flowers, | 2 00 |
| Mrs. E. S. Joyce, “ “ | 1 00 |
| Miss S. W. Story, “ “ | 1 00 |
| Mrs. H. D. Wilmarth, <i>Sabbatia chloroides</i> , | 1 00 |

AUGUST 18.

| | |
|--|------|
| GLADIOLI.—Twenty named varieties, in spikes, Mrs. T. L. Nelson, | |
| Second, O. B. Hadwen, | 6 00 |
| Ten named varieties, in spikes, F. Bacheller, | 4 00 |
| Six named varieties, in spikes, F. Bacheller, | 3 00 |
| Second, Mrs. T. L. Nelson, | 2 00 |
| Single spike, named, O. B. Hadwen, for Baroness Burdett-Coutts, | 1 00 |
| Display of named and unnamed varieties, filling one hundred bottles, James Cartwright, | 6 00 |
| CUT FLOWERS.—Collection, of not less than twenty-five named species of Annuals, Mrs. E. M. Gill, | |
| | 3 00 |
| PHLOX DRUMMONDI.—Fifty bottles, not less than six varieties, Mrs. T. L. Nelson, | |
| | 2 00 |
| Second, James Nugent, | 1 00 |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | |
| | 2 00 |

Gratuities:—

| | |
|--|------|
| C. L. Allen & Co., Queens, N. Y., Seedling Gladioli, | 2 00 |
| James F. C. Hyde, Hyde's White Gladiolus, | 1 00 |
| Francis B. Hayes, Roses, Dahlias, etc., | 3 00 |
| Edwin Fewkes, Roses, etc., | 2 00 |
| Warren Heustis, Hybrid Perpetual Roses, | 1 00 |
| E. Sheppard, Dahlias, | 1 00 |
| Daniel Duffley, Helianthus, | 1 00 |
| John C. Hovey, <i>Clematis Davidsoni</i> , | 1 00 |
| Mrs. L. P. Weston, Cut Flowers, | 2 00 |

| | |
|---|--------|
| Mrs. E. M. Gill, Cut Flowers, | \$1 00 |
| Miss S. W. Story, " " | 1 00 |
| W. K. Wood, Display of " | 1 00 |
| John Parker, " " " | 1 00 |

AUGUST 25.

| | |
|--|------|
| ASTERS.—Large Flowered, thirty blooms, not less than ten varieties, | |
| E. Sheppard, | 4 00 |
| Second, Francis B. Hayes, | 3 00 |
| Third, M. B. Faxon, | 2 00 |
| Victoria, or Rose Flowered, thirty blooms, not less than eight varieties, John L. Gardner, | |
| Second, James Nugent, | 3 00 |
| Third, Mrs. E. M. Gill, | 2 00 |
| Pompons, thirty sprays, not less than six varieties, one spray in each bottle, Francis B. Hayes, | |
| BASKET OF FLOWERS.—Best arranged, Mrs. E. S. Joyce, | 2 00 |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | 2 00 |

Gratuities :—

| | |
|---|------|
| Mrs. E. M. Gill, Asters and Gladioli, | 2 00 |
| Mrs. L. P. Weston, Asters, | 1 00 |
| E. Sheppard, " | 1 00 |
| Francis B. Hayes, Cut Flowers, | 3 00 |
| Mrs. L. P. Weston, " " | 2 00 |
| Miss S. W. Story, " " | 1 00 |
| John Parker, " " | 1 00 |

SEPTEMBER 1.

| | |
|--|------|
| TROPÆOLUMS.—Display, filling twenty-five bottles, the second prize to Adin A. Hixon, | |
| MARIGOLDS.—Display, filling twenty-five bottles, three flowers in each, Adin A. Hixon, | |
| Second, Mrs. E. M. Gill, | 3 00 |
| Third, Francis B. Hayes, | 2 00 |
| 1 00 | |
| CUT FLOWERS.—Display, filling one hundred bottles, Francis B. Hayes, | |
| Second, Mrs. E. M. Gill, | 4 00 |
| Third, Mrs. L. P. Weston, | 3 00 |
| 2 00 | |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | 2 00 |

Gratuities :—

| | |
|--|------|
| E. Sheppard, Dahlias, Petunias, and Phloxes, | 2 00 |
| Francis B. Hayes, Dahlias and Hydrangeas, | 1 00 |
| Adin A. Hixon, Asters and Petunias, | 1 00 |
| Joseph Comley, Seedling Pelargoniums, | 1 00 |
| Miss Sarah W. Story, Cut Flowers, | 1 00 |

PRIZES AND GRATUITIES FOR PLANTS AND FLOWERS. 247

| | |
|--|--------|
| John Parker, Cut Flowers, | \$1 00 |
| E. H. Hitchings, Native Flowers, | 2 00 |
| Mrs. P. D. Richards, twelve species of Golden Rod, | 1 00 |

SEPTEMBER 8.

| | |
|--|------|
| HYBRID PERPETUAL ROSES.—Twelve blooms, of twelve named varieties, in vases, John B. Moore & Son, | 3 00 |
| DOUBLE ZINNIAS.—Twenty-five flowers, not less than six varieties, Mrs. William Latham, | 3 00 |
| Second, Hovey & Co., | 2 00 |
| Third, H. B. Watts, | 1 00 |
| DIANTHUS, Annual and Biennial varieties.—Fifty bottles, single trusses, E. Sheppard, | 3 00 |
| Second, Mrs. Austin W. Ward, | 2 00 |
| Third, H. B. Watts, | 1 00 |
| HERBACEOUS PLANTS.—Collection, Mrs. L. P. Weston, | 2 00 |

Gratuities :—

| | |
|---|------|
| Francis B. Hayes, Roses and Dahlias, | 2 00 |
| Mrs. Austin W. Ward, Dianthus and Sweet Peas, | 1 00 |
| Adin A. Hixon, Pelargoniums, | 1 00 |
| Mrs. L. P. Weston, Cut Flowers, | 1 00 |
| “ “ “ Asters, | 2 00 |
| Mrs. E. M. Gill, “ | 1 00 |
| Miss S. W. Story, “ | 1 00 |

ANNUAL EXHIBITION.

SEPTEMBER 18, 19, 20, AND 21.

Hunnewell Premiums.

| | |
|---|--------|
| EVERGREEN TREES AND SHRUBS.—Display in pots, of other than Native Evergreens of New England, William C. Strong, | \$8 00 |
| Second, Hovey & Co., | 6 00 |

Special Prize, offered by Samuel Smith, of Newport, R. I.

| | |
|---|-------|
| SINGLE DAHLIAS.—Twenty-five bottles, one spray each, not less than twelve varieties, Edwin Sheppard, a Piece of Plate of the value of | 12 00 |
|---|-------|

Society's Prizes.

| | |
|---|-------|
| GREENHOUSE PLANTS.—Twelve Greenhouse and Stove Plants, of different varieties, one <i>Dracæna</i> and one <i>Croton</i> admissible, F. L. Ames, | 30 00 |
| Second, Samuel R. Payson, | 25 00 |
| Third, Hovey & Co., | 20 00 |

| | |
|--|---------|
| SPECIMEN FLOWERING PLANTS.—Six named varieties in bloom, | |
| Francis B. Hayes, | \$10 00 |
| Second, John L. Gardner, | 8 00 |
| Single named specimen, F. L. Ames, for <i>Dipladenia Boliviensis</i> , | 5 00 |
| Second, F. L. Ames, for <i>Epidendrum prismatocarpum</i> , | 3 00 |
| VARIEGATED LEAVED PLANTS.—Six named varieties, not offered in a collection of Greenhouse Plants; Crotons and Dracænas not admissible, Hovey & Co., | |
| | 12 00 |
| Single specimen, named, not offered in any collection, John L. Gardner, for <i>Eurya latifolia</i> var., | 5 00 |
| CALADIUMS.—Six named varieties, Waldo Adams, | |
| | 5 00 |
| Second, Waldo Adams, | 4 00 |
| FERNS.—Six named varieties, no Adiantums admissible, F. L. Ames, | |
| | 6 00 |
| Second, Hovey & Co., | 4 00 |
| ADIANTUMS.—Six named varieties, F. L. Ames, | |
| | 5 00 |
| TREE FERN.—Single specimen, named, Hovey & Co., for <i>Alsophila australis</i> , | |
| | 6 00 |
| DRACÆNAS.—Six named varieties, Samuel R. Payson, | |
| | 6 00 |
| Second, Hovey & Co., | 5 00 |
| CROTONS.—Six named varieties, in not exceeding six-inch pots, | |
| F. L. Ames, | 4 00 |
| Second, Samuel R. Payson, | 3 00 |
| PALM.—Single specimen, named, Hovey & Co., for <i>Pritchardia Pacifica</i> , | |
| | 5 00 |
| Second, F. L. Ames, for <i>Phenacophorum Sechellarum</i> , | 4 00 |
| NEPENTHES.—Three plants, F. L. Ames, | |
| | 5 00 |
| AGAVES.—Six distinct named varieties, Hovey & Co., | |
| | 5 00 |
| Second, Francis B. Hayes, | 4 00 |
| CACTI.—Twelve named species and varieties, Hovey & Co., | |
| | 5 00 |
| SUCCULENTS. — Collection (other than Agaves, Yuccas, or Cacti) of twelve named species and varieties, Hovey & Co., | |
| | 5 00 |
| BEGONIAS. — Tuberous Rooted, six seedling varieties, the second prize to Hovey & Co., | |
| | 3 00 |
| GLADIOLI.—Best display and best kept, filling one hundred bottles, | |
| E. Sheppard, | 10 00 |
| DAHLIAS.—Twelve named varieties, John L. Gardner, | |
| | 5 00 |
| Second, Francis B. Hayes, | 4 00 |
| Third, John Parker, | 3 00 |
| Six named varieties, Charles W. Hoitt, Nashua, N. H., | 3 00 |
| Second, James Willey, | 2 00 |
| Single named flower, John L. Gardner, | 2 00 |
| Second, Charles W. Hoitt, | 1 00 |
| LILIPUTIAN DAHLIAS.—General display, James Willey, | |
| | 3 00 |
| CUT FLOWERS.—Best display, and best kept during the exhibition, filling one hundred and fifty bottles, Mrs. E. M. Gill, | |
| | 16 00 |
| Second, Mrs. L. P. Weston, | 14 00 |
| Third, Francis B. Hayes, | 12 00 |

PRIZES AND GRATUITIES FOR PLANTS AND FLOWERS. 249

| | |
|---|--------|
| BASKET OF FLOWERS.—Best arranged, and best kept through the exhibition, Mrs. E. S. Joyce, | \$5 00 |
| TABLE DESIGN.—Best, and best kept through the exhibition, Miss S. W. Story, | 5 00 |

Gratuities :—

| | |
|--|-------|
| Francis B. Hayes, Plants, | 5 00 |
| Hovey & Co., “ | 5 00 |
| Samuel R. Payson, Ferns and Crotons, | 8 00 |
| John B. Moore & Son, Hybrid Perpetual Roses, | 3 00 |
| E. L. Beard, Tuberous Rooted Begonias, | 2 00 |
| P. G. Hanson, Celosias, | 1 00 |
| W. C. Strong, Foliage of Trees and Shrubs, | 2 00 |
| John L. Gardner, Seedling Gloxinias, | 2 00 |
| William H. Spooner, Double Stocks, | 2 00 |
| A. A. Hixon, Petunias, | 1 00 |
| J. W. Manning, Helianthus, fl. pl., | 1 00 |
| E. & C. Woodman, New Coleus Progress, | 1 00 |
| John Parker, Dahlias, | 2 00 |
| E. Sheppard, “ | 1 00 |
| E. D. Sturtevant, <i>Nelumbium speciosum</i> , | 5 00 |
| “ “ <i>Victoria regia</i> , | 5 00 |
| “ “ <i>Nymphæas</i> , in variety, | 15 00 |
| Hovey & Co., Flowers of <i>Nymphæas</i> , | 2 00 |
| Benjamin Gray, “ | 1 00 |
| F. L. Ames, Cut Flowers, | 3 00 |
| A. A. Hixon, “ “ | 2 00 |
| Miss E. H. Craft, “ “ | 2 00 |
| Mrs. P. D. Richards, Native Flowers, | 2 00 |
| E. H. Hitchings, “ “ | 2 00 |
| Carrie S. Leeds, “ “ | 1 00 |
| Frank H. Forbes, Bouquet of Native Flowers, | 1 00 |
| Mrs. G. R. Peckham, “ “ “ “ | 1 00 |
| Annie M. Tilley, Design of Dried Flowers, | 1 00 |

OCTOBER 6.

Gratuity :—

| | |
|-------------------------------------|------|
| John L. Gardner, Dahlias, | 3 00 |
|-------------------------------------|------|

OCTOBER 20.

Gratuities :—

| | |
|--|------|
| John L. Gardner, <i>Erica hyemalis</i> , | 2 00 |
| “ “ “ <i>Dendrobium chrysanthum</i> , | 2 00 |
| Hovey & Co., <i>Nymphæas</i> , | 1 00 |

CHRYSANTHEMUM SHOW.

NOVEMBER 8 AND 9.

| | |
|--|--------|
| CHRYSANTHEMUMS.—Six Large Flowered, or Chinese, H. P. Walcott, | \$8 00 |
| Second, E. W. Wood, | 6 00 |
| Six Japanese, H. P. Walcott, | 8 00 |
| Second, E. W. Wood, | 6 00 |
| Four Pompons, H. P. Walcott, | 4 00 |
| Second, E. W. Wood, | 3 00 |
| Specimen Plant, Large Flowered, or Chinese, H. P. Walcott, | 4 00 |
| Second, E. W. Wood, | 3 00 |
| Specimen Plant, Japanese, H. P. Walcott, | 4 00 |
| Second, E. W. Wood, | 3 00 |
| Specimen Plant, Pompon, E. W. Wood, | 3 00 |
| Second, H. P. Walcott, | 2 00 |
| Display of named plants, in pots, all classes, not less than ten varieties, H. P. Walcott, | 15 00 |
| Second, E. W. Wood, | 12 00 |
| Third, Norton Brothers, | 8 00 |
| Twelve cut blooms, Large Flowered, or Chinese, Edwin Fewkes, | 4 00 |
| Second, H. P. Walcott, | 3 00 |
| Third, State Lunatic Hospital, Worcester, | 2 00 |
| Six cut blooms, Large Flowered, or Chinese, Edwin Fewkes, | 3 00 |
| Second, H. P. Walcott, | 2 00 |
| Third, E. W. Wood, | 1 00 |
| Display of thirty distinct named varieties of Pompons and Japanese, cut blooms, H. P. Walcott, | 6 00 |
| Second, Edwin Fewkes, | 5 00 |
| Third, E. W. Wood, | 4 00 |
| Fourth, State Lunatic Hospital, Worcester, | 3 00 |
| ORCHIDS.—Three varieties, in bloom, F. L. Ames, | 8 00 |
| Second, E. W. Gilmore, | 6 00 |
| Single Plant, in bloom, F. L. Ames, | 4 00 |
| Second, E. W. Gilmore, | 3 00 |

Gratuities:—

| | |
|---|------|
| John L. Gardner, Chrysanthemum Plants, | 8 00 |
| Marshall P. Wilder, “ “ | 6 00 |
| Hovey & Co., “ “ | 6 00 |
| Mrs. E. M. Gill, Cut Chrysanthemums, | 3 00 |
| Edwin Fewkes, “ “ | 2 00 |
| Mrs. L. P. Weston, “ “ | 2 00 |
| V. H. Hallock, Son & Thorpe, Queens, N. Y., Cut Chrysanthemums, | 1 00 |
| E. Sheppard, Chrysanthemums and Pelargoniums, | 2 00 |
| Francis B. Hayes, Epacris Plants, | 2 00 |

PRIZES AND GRATUITIES FOR PLANTS AND FLOWERS. 251

| | |
|---|--------|
| T. W. Dee, <i>Fittonia argyrea</i> , | \$2 00 |
| F. L. Ames, <i>Anthurium Andreanum</i> and Cut Flowers, | 5 00 |
| Francis B. Hayes, Cut Flowers, | 2 00 |
| Miss S. W. Story, Cut Flowers, | 1 00 |

NOVEMBER 24.

Gratuity:—

| | |
|------------------------------|------|
| George W. Saunders, Pansies, | 1 00 |
|------------------------------|------|

DECEMBER 1.

Gratuity:—

| | |
|---|------|
| John L. Gardner, <i>Cypripedium insigne</i> , | 2 00 |
|---|------|

SILVER MEDALS.

- February 17. Francis B. Hayes, Camellias and *Clianthus Dampieri*.
 " 24. John L. Gardner, Double Flowered Blackberry.
 Azalea and Rose Show, March 22. E. M. Wood & Co., *Lilium longiflorum*
eximium Harrisii.
 " " " " " " Woolson & Co., Narcissus in variety.
 " " " " " " Edward L. Beard, Fancy Pansies.
 March 31. F. L. Ames, Orchid Flowers.
 May 29. David Allan, Gardener to R. M. Pratt, *Dendrobium thyrsiflorum*.
 June 9. Hovey & Co., Cereus No. 2, C. M. Hovey.
 Rose and Strawberry Show, June 26. Ellwanger & Barry, Rochester, N. Y.,
 Collection of Hardy Roses.
 " " " " " " John B. Moore & Son, Seedling Gloxinias.
 July 14. Henry P. Walcott, Seedling Delphiniums.
 Annual Exhibition, September 18-21. Hovey & Co., *Ficus elastica aurea*.
 " " " " F. L. Ames, *Nepenthes Mastersiana*.
 " " " " " " *Aralia Chabrieri*.
 " " " " H. H. Hunnewell, *Cattleya aurea*.
 " " " " " " Collection of Orchids.
 " " " " " " Collection of Crotons
 and Dracænas.
 " " " " " " *Osmanthus ilicifolius*
var.
 " " " " David Allan, Gardener to R. M. Pratt,
Polypodium plumosum.
 " " " " David Allan, Gardener to R. M. Pratt,
 Collection of Crotons.
 " " " " David Allan, Gardener to R. M. Pratt,
 Collection of Ferns and Lycopods.
 " " " " Edmund D. Sturtevant, Bordentown,
 N. J., *Nymphæa Zanzibarensis*.
 Chrysanthemum Show, November 8 and 9. E. W. Wood, Seedling Chrysan-
 themums.

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|---------------------------------------|--|
| Chrysanthemum Show, November 8 and 9. | Henry P. Walcott, Seedling Chrysanthemums. |
| “ “ “ “ | Henry P. Walcott, Seedling Chrysanthemum, Pontiac. |
| “ “ “ “ | F. L. Ames, Orchids. |
| “ “ “ “ | David Allan, Gardener to R. M. Pratt, Cut Flowers. |
| “ “ “ “ | David Allan, Gardener to R. M. Pratt, <i>Ouviranda fenestralis</i> . |
| December 1. | Mrs. L. P. Weston, Exhibits of Herbaceous Plants. |

FIRST-CLASS CERTIFICATES OF MERIT.

| | |
|---------------------------------------|--|
| January 20. | W. C. Page, Seedling Carnation Victor. |
| March 10. | Sewall Fisher, “ “ Anna Webb. |
| Azalea and Rose Show, March 22. | Henry R. Comley, Seedling Carnation No. 1. |
| “ “ “ “ | June 13. Hovey & Co., <i>Lilium Takasango</i> . |
| Rose and Strawberry Show. June 26. | John C. Hovey, Herbaceous Pæony No. 3, Grandiflora. |
| “ “ “ “ | August 11. William H. Spooner, Seedling Gladiolus No. 501. |
| “ “ “ “ | “ 18. C. L. Allen & Co., Queens, N. Y., Gladioli Martha Washington, Emma Thursby, and Bayard Taylor. |
| “ “ “ “ | “ 18. John C. Hovey, <i>Montbretia cosmæflora</i> . |
| “ “ “ “ | “ 25. John C. Hovey, <i>Amaryllis Hallii</i> . |
| Chrysanthemum Show, November 8 and 9. | Henry P. Walcott, Seedling Chrysanthemums. |

REPORT
OF THE
COMMITTEE ON FRUITS,
FOR THE YEAR 1883.

By E. W. WOOD, CHAIRMAN.

With the exception of Apples and Peaches, the fruit crop, the past season, has been above the average, both in quantity and quality. Considering that it was the non-fruited year with our apple orchards, the exhibits have been remarkably good; and this was especially noticeable with the Baldwins, which were shown at the Annual and later exhibitions in extent and quality comparing favorably with fruitful years.

The heavy body of ice remaining upon the ground almost through the entire winter injured the strawberry vines in many places, but the favorable weather after the spring opened, produced an unusually heavy crop where the vines escaped injury. The later fruits suffered from the severe drought which prevailed throughout the State, there being no rainfall after the first of July, sufficient to reach the roots of pear trees, until late in October, and the late varieties of pears, except in favorable locations, or where the vigor of the trees was sustained by irrigation, were not up to the average in size, though good in quality.

The past season has been remarkably favorable for the grape in open culture; there has been very little mildew, and the grape suffers less from long-continued heat and drought than any other fruit—in fact it requires this condition of the atmosphere to give it its highest quality.

The prizes offered for late Apples and Pears, March 22, were all awarded.

STRAWBERRIES. — The show at the special exhibition of this fruit, June 26, compared favorably with those of previous years. The Committee have tried, by offering premiums covering a wide range of varieties, to increase the exhibition of this fruit, and at the same time to show the merits of the different varieties by comparison. No fruit shows so much change in the varieties offered from year to year, as the strawberry. Some of the best known and most popular kinds of a few years since, have not appeared upon our tables the past year. But a single dish each of the *Triomphe de Gand*, *Hovey*, and *Jucunda*, was shown; and of the large number of new varieties that have appeared within the past few years, but a small part seem to have established themselves so as to prove that they have come to stay; perhaps among these may be named the *Sharpless*, *Charles Downing*, and *Hervey Davis*.

The first prize for the best four quarts shown was again awarded for the *Sharpless*. The Special Prize of ten dollars offered by Hon. Marshall P. Wilder, for the best four quarts of the variety of finest form, color, and quality, was awarded to a new seedling grown by Warren Heustis, which he has named *Belmont*. This seems to be a promising new variety; in color and quality it resembles the *Sharpless*, but is much better in form.

CHERRIES. — Owing to unfavorable weather at the time of ripening, the exhibits of this fruit were not as good as usual; of the fourteen prizes offered, but nine were awarded.

CURRANTS were well represented in their season, the *Versaillaise* being the principal red variety shown, and the *Transparent* and *Dana's Transparent* the principal white kinds; the former taking the prize when shown in competition with the latter. This fruit is easily grown, reliable for a crop, and meets with ready sale.

RASPBERRIES were shown in more than the usual quantity. A new variety shown by C. M. Atkinson, gardener to John L. Gardner, called *McLaren's Prolific*, attracted special notice; the berries were of good size and color, the quality good, and the plants are said to be of vigorous growth and productive.

BLACKBERRIES. — The prizes offered for this fruit were all awarded, but the amount shown was limited. We are still waiting for a hardy variety, equal in size and quality to the *Dorchester*, which would very quickly increase the production of this desirable fruit.

GOOSEBERRIES.—There are comparatively but few growers of this fruit, and the competition was limited. There being little demand for gooseberries for market, their cultivation is confined almost entirely to amateurs.

PLUMS were again shown in liberal quantity, several growers after competing in all the classes for which prizes were offered, placing eight or ten varieties on the table for exhibition. It is evident that the growers have found some means to prevent the ravages of the curculio, which threatened not many years since to exterminate the plum from our list of fruits.

PEACHES have not met the expectation which the apparent good condition of the trees in the spring promised. The competition has been limited, and while a part of the fruit shown was of good size and quality, a larger portion than usual showed that the trees from which it was picked were affected by that fatal disease, the yellows; but the peach tree is so easily and quickly grown and so profitable when productive, that the demand for trees is increasing every year.

GRAPES.—Of the forty-two prizes offered for Native Grapes during the year, forty were awarded, and among the varieties most generally grown the competition was strong, and the fruit of superior quality. The prizes of seventy-five and twenty-five dollars for Pocklington grapes at the Annual Exhibition were taken by John Charlton, of Rochester, N. Y., and Joseph S. Chase, of Malden. John B. Moore & Son made a display of their seedling, Francis B. Hayes. It seemed perfectly ripe, and in quality was unquestionably the best white grape on exhibition. John Pocklington showed two new white grapes, Nos. 1 and 2, and claimed that they were to be classed among the early varieties. As the specimens shown did not appear to be fully ripe, he stated that the season with him had not been favorable, having been unusually wet, and they had not ripened as early as usual. George A. Stone showed the Empire State, a white grape not ripe enough to judge accurately of its quality. A. J. Bigelow showed, October 6, eight bunches of Concords the average weight being twenty-one and five-eighths ounces, the three heaviest bunches averaging twenty-two and one-half ounces. The bunches were well formed, and the berries large, even, and well ripened.

FOREIGN GRAPES.—The show of this fruit was much larger than for many years. August 25, John S. Farlow showed ten varieties,

and at the Annual Exhibition, besides competing in every class, he placed fifteen varieties upon the table for exhibition. The bunches were large and well formed, but not quite large enough to take either of the two special prizes offered for the last five years but never awarded.

PEARS.—Of the one hundred and forty-one prizes offered for pears, one hundred and thirty-eight were awarded. While the crop has not been as abundant as in some previous years, the specimens shown have been uniformly of good quality and above the average in size. No new pears of special merit have been brought to the notice of the Committee. Several dishes of the Keiffer have been shown, and although of good size, form, and color, its quality must place it among the cooking rather than the dessert pears.

APPLES.—Of the one hundred and eight prizes offered, seventy-three have been awarded, a much larger number than usual on the off or non-fruiting year. Even a slight tendency to a more even distribution, in succeeding years, of this fruit, so desirable for domestic uses, is a fact to be noted and an encouragement to further efforts in this direction.

The only new fruit entered for a Prospective Prize was the Seedling Strawberry, Banquet, by J. R. Hawkins, Mountainville, Orange County, N. Y.

The Committee have awarded in prizes and gratuities eight hundred and fifty dollars, leaving an unexpended balance of just one hundred dollars; this balance is largely from the unawarded prizes for apples and peaches.

The summing up for the year is encouraging for the growers of fruit. Fruit has suffered less than any other crop from the long continued dry weather. There has been a ready sale for all kinds at good prices; there have been no severe storms that have seriously injured fruit, and the weather has been favorable for gathering and marketing. The three most serious obstacles to fruit-growing in this State are the pear blight; the yellows among peach trees, and the codling moth. Any one who can, from study or experience, render any aid in overcoming these enemies of fruit-growers, will confer a favor not only upon cultivators, but upon every lover of fruit.

We would again acknowledge our obligation to the Pomological Society, whose action upon the recommendation of its President

we hope will soon result in eliminating from our schedules, prize cards, and reports, the senseless prefixes to the names of many of our fruits.

E. W. WOOD,
P. B. HOVEY,
BENJAMIN G. SMITH,
WARREN FENNO,
JACOB W. MANNING,
CHARLES F. CURTIS, } *Committee.*

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

MARCH 22.

| | |
|--|--------|
| WINTER APPLES.—Any variety, C. Terry, Northern Spy, | \$3 00 |
| Second, John B. Moore & Son, " " | 2 00 |
| WINTER PEARS.—Any variety, Warren Fenno, Josephine of Malines, | 3 00 |
| Second, B. G. Smith, Duchess of Bordeaux, | 2 00 |

Gratuities:—

| | |
|---|------|
| A. S. McIntosh, Collection of Apples and Pears, | 2 00 |
| Robert Manning, Lady Apples, | 1 00 |
| Edward Sumner, Lemons, | 1 00 |

MARCH 31.

Gratuity:—

| | |
|---|------|
| J. W. Talbot, Apples and Pears, | 1 00 |
|---|------|

APRIL 14.

Gratuities:—

| | |
|---|------|
| C. E. Grant, Apples and Pears, | 1 00 |
| Francis B. Hayes, Strawberries, | 2 00 |

APRIL 21.

Gratuity:—

| | |
|---|------|
| William H. Hunt, Hunt Apples, | 1 00 |
|---|------|

JUNE 9.

Gratuity:—

| | |
|--|------|
| C. E. Grant, Apples and Pears, | 1 00 |
|--|------|

JUNE 16.

Gratuity:

| | |
|--|------|
| William Doran & Son, Strawberries, | 1 00 |
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ROSE AND STRAWBERRY SHOW.

JUNE 26.

Special Prize offered by Hon. Marshall P. Wilder.

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|--|---------|
| STRAWBERRIES.—For the best four quarts of the variety of finest form, color, and quality, Warren Heustis, Belmont, | \$10 00 |
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Special Prizes offered by the Society.

| | |
|--|-------|
| STRAWBERRIES.—For the best four quarts of any variety, Warren Heustis, Sharpless, Silver Cup, value, | 20 00 |
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| | |
|--|---------|
| Second, Joseph D. Fitts, Providence, R. I., Jersey Queen, | \$10 00 |
| Third, James H. Kimball, Providence, R. I., Manchester, Harris's Treatise on Insects. | |

Regular Prizes.

| | |
|--|------|
| STRAWBERRIES.—Four quarts of Downing, William Doran & Son, | 3 00 |
| Second, E. W. Wood, | 2 00 |
| Miner's Prolific, L. W. Weston, | 3 00 |
| Seth Boyden, E. W. Wood, | 3 00 |
| Sharpless, E. W. Wood, | 3 00 |
| Wilder, Joseph Burnett, | 3 00 |
| Second, Marshall P. Wilder, | 2 00 |
| Two quarts of Bidwell, James H. Kimball, | 2 00 |
| Second, Marshall P. Wilder, | 1 00 |
| Brighton Pine, Warren Fenno, | 2 00 |
| Champion, Joseph D. Fitts, | 2 00 |
| Charles Downing, Warren Fenno, | 2 00 |
| Second, E. W. Wood, | 1 00 |
| Col. Cheney, Joseph D. Fitts, | 2 00 |
| Second, William Doran & Son, | 1 00 |
| Cumberland Triumph, Marshall P. Wilder, | 2 00 |
| Hervey Davis, Marshall P. Wilder, | 2 00 |
| Jersey Queen, Joseph D. Fitts, | 2 00 |
| Second, James H. Kimball, | 1 00 |
| Jucunda, C. E. Grant, | 2 00 |
| Manchester, Joseph D. Fitts, | 2 00 |
| Second, Marshall P. Wilder, | 1 00 |
| Miner's Prolific, Joseph D. Fitts, | 2 00 |
| Monarch, Joseph D. Fitts, | 2 00 |
| Second, C. E. Grant, | 1 00 |
| Seth Boyden, E. W. Wood, | 2 00 |
| Second, Marshall P. Wilder, | 1 00 |
| Sharpless, George V. Fletcher, | 2 00 |
| Second, Warren Heustis, | 1 00 |
| Any other variety, Warren Heustis, Belmont, | 2 00 |
| Second, Joseph D. Fitts, Gypsy, | 1 00 |
| Collection of not less than six varieties, one quart of each, Joseph D. Fitts, | 4 00 |
| One quart of any new variety, not previously exhibited, J. R. Hawkins, Mountainville, N. Y., Banquet, | 3 00 |
| Second, Joseph D. Fitts, Seneca Queen, | 2 00 |
| Fifty berries of any variety, Warren Heustis, | 2 00 |
| CHERRIES.—Two quarts of any variety, I. P. Langworthy, | 2 00 |
| Second, C. E. Grant, | 1 00 |
| FOREIGN GRAPES.—Two bunches of any variety, Francis B. Hayes, | |
| Victoria Hamburg, | 3 00 |
| Second, Francis B. Hayes, Black Hamburg, | 2 00 |
| Third, E. Sheppard, | 1 00 |

Gratuities:

| | |
|--|--------|
| C. E. Grant, Cherries, Strawberries, and Apples, | \$2 00 |
| A. D. Capen, Cherries and Strawberries, | 1 00 |
| Marshall P. Wilder, Strawberries, | 1 00 |
| J. R. Hawkins, Raspberries, | 1 00 |

JULY 7.

| | |
|--|------|
| STRAWBERRIES.—Two quarts of any variety, Warren Heustis, Belmont, | 2 00 |
| CERRIES.—Two quarts of Black Eagle, C. E. Grant, | 2 00 |
| Two quarts of Black Tartarian, “ “ | 2 00 |
| Two quarts of Downer, “ “ | 2 00 |
| Second, Samuel Lockwood, | 1 00 |
| Two quarts of any other variety, C. E. Grant, Napoleon, | 2 00 |
| Second, Horace Partridge, May Duke, | 1 00 |

Gratuity:—

| | |
|--|------|
| B. G. Smith, Raspberries and Currants, | 2 00 |
|--|------|

JULY 14.

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|--|------|
| CERRIES.—Two quarts of any variety, Warren Fenno, Downer, | 2 00 |
| RASPBERRIES.—Two quarts of any variety, C. E. Grant, Cuthbert, | 2 00 |
| Second, William Doran & Son, Franconia, | 1 00 |
| CURRENTS.—Four quarts of any Red variety, B. G. Smith, Versailles, laise, | 3 00 |
| Second, E. W. Wood, Versailles, | 2 00 |
| Third, William Doran & Son, “ | 1 00 |
| Two quarts of any White variety, B. G. Smith, Transparent, | 3 00 |
| Second, B. G. Smith, Dana's Transparent, | 2 00 |

Gratuities:—

| | |
|--|------|
| C. E. Grant, Raspberries and Currants, | 1 00 |
| John L. Gardner, McLaren's Prolific Raspberries, | 1 00 |
| A. D. Capen, Raspberries, | 1 00 |
| M. W. Chadbourne, Currants and Gooseberries, | 1 00 |
| B. G. Smith, June-Berries, | 1 00 |

JULY 21.

| | |
|--|------|
| RASPBERRIES.—Not less than four varieties, two quarts of each, William Doran & Son, | 4 00 |
| Second, B. G. Smith, | 3 00 |
| Two quarts of any variety, William Doran & Son, Franconia, | 2 00 |
| Second, A. D. Capen, Franconia, | 1 00 |
| BLACKCAPS.—Two quarts of any variety, C. E. Grant, Mammoth, | 2 00 |
| CURRENTS.—Two quarts of Dana's Transparent, B. G. Smith, | 2 00 |
| Second, C. E. Grant, | 1 00 |
| Two quarts of Versailles, Lemuel Clapp, | 2 00 |
| Second, B. G. Smith, | 1 00 |

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|--|--------|
| Two quarts of any other variety, B. G. Smith, Transparent, | \$2 00 |
| Second, William Doran & Son, Cherry, | 1 00 |
| BLACKBERRIES.—Two quarts of any variety, A. S. McIntosh, Dorchester, | 2 00 |

JULY 28.

| | |
|---|------|
| CURRENTS.—Two quarts of any Red variety, B. G. Smith, Versailles, | 2 00 |
| Second, Mrs. E. M. Gill, Versaillaise, | 1 00 |
| Two quarts of any White variety, M. W. Chadbourne, Transparent, Second, B. G. Smith, Transparent, | 2 00 |
| BLACKBERRIES.—Two quarts of any variety, A. S. McIntosh, Dorchester, | 2 00 |
| Second, James Nugent, Dorchester, | 1 00 |
| GOOSEBERRIES.—Two quarts of any Native variety, B. G. Smith, Smith's Seedling, | 2 00 |
| Second, Warren Fenno, Downing, | 1 00 |

Gratuity:—

| | |
|---|------|
| Francis B. Hayes, Foreign Grapes, | 3 00 |
|---|------|

AUGUST 4.

| | |
|---|------|
| BLACKBERRIES.—Two quarts of any variety, James Nugent, Dorchester, | 2 00 |
| Second, A. S. McIntosh, Dorchester, | 1 00 |
| GOOSEBERRIES.—Two quarts of any Foreign variety, B. G. Smith, Whitesmith, | 2 00 |
| Second, B. G. Smith, Bang-Up, | 1 00 |
| PEARS.—Summer Doyenne, E. W. Wood, | 2 00 |
| Second, Peveril Meigs, | 1 00 |
| Any other variety, Horace Eaton, André Desportes, | 2 00 |
| Second, Hovey & Co., Quimper, | 1 00 |
| APRICOTS.—Any variety, Moses Darling, Jr., | 2 00 |

Gratuity:—

| | |
|--|------|
| Samuel Hartwell, Peaches and Apples, | 1 00 |
|--|------|

AUGUST 11.

| | |
|---|------|
| APPLES.—Sweet Bough, Warren Fenno, | 2 00 |
| Any other variety, Lemuel Clapp, Williams, | 2 00 |
| Second, Samuel Hartwell, Williams, | 1 00 |
| PEARS.—Beurre Giffard, Warren Fenno, | 2 00 |
| Second, Mrs. Mary Langmaid, | 1 00 |
| Any other variety, Robert Manning, Bloodgood, | 2 00 |
| Second, George Frost, Quimper, | 1 00 |

Gratuity:—

| | |
|--|------|
| Samuel Hartwell, Apples, Pears, and Peaches, | 1 00 |
|--|------|

AUGUST 18.

| | |
|--|--------|
| APPLES. — Red Astrachan, J. T. Foster, | \$2 00 |
| Second, C. C. Shaw, | 1 00 |
| Williams, Joseph Coolidge, | 2 00 |
| Second, Samuel Hartwell, | 1 00 |
| PEARS. — Clapp's Favorite, Horace Eaton, | 2 00 |
| Second, Warren Fenno, | 1 00 |
| Elizabeth, Mrs. Mary Langmaid, | 2 00 |
| Second, Warren Fenno, | 1 00 |
| Any other variety, C. N. Brackett, Brandywine, | 2 00 |
| Second, Hovey & Co., " | 1 00 |
| FIGS. — Any variety, Francis B. Hayes, | 2 00 |

Gratuities:—

| | |
|--|------|
| Horace Partridge, Foreign Grapes, | 1 00 |
| George Frost, Pears, | 1 00 |
| Robert Manning, Pears and Blackberries, | 1 00 |
| Samuel Hartwell, Pears, Apples, and Peaches, | 2 00 |
| Mrs. Benjamin Fobes, Figs, | 1 00 |
| Warren Fenno, Pears, | 1 00 |
| M. W. Chadbourne, Pears, | 1 00 |

AUGUST 25.

| | |
|---|------|
| PEARS. — Bartlett, Mrs. Mary Langmaid, | 2 00 |
| Second, Charles L. Fowle, | 1 00 |
| Rostiezer, M. W. Chadbourne, | 2 00 |
| Second, Horace Eaton, | 1 00 |
| Tyson, A. S. McIntosh, | 2 00 |
| Second, Samuel McIntosh, | 1 00 |
| Any other variety, Warren Fenno, Ananas d' été, | 2 00 |
| Second, Horace Eaton, Petite Marguerite, | 1 00 |

Gratuities:—

| | |
|--|------|
| Samuel Hartwell, Pears, Apples, and Plums, | 2 00 |
| John S. Farlow, ten varieties of Foreign Grapes, Silver Medal. | |

SEPTEMBER 1.

| | |
|--|------|
| APPLES.—Any variety, Samuel Hartwell, Gravenstein, | 2 00 |
| Second, " " Holden, | 1 00 |
| PEARS.—Bartlett, Mrs. Mary Langmaid, | 2 00 |
| Second, T. M. Davis, | 1 00 |
| Any other variety, Horace Partridge, Belle Lucrative, | 2 00 |
| Second, C. E. Grant, Flemish Beauty, | 1 00 |
| PEACHES.—Any variety, Samuel Hartwell, Crawford's Early, | 3 00 |
| PLUMS.—Any variety, Horace Eaton, Washington, | 2 00 |
| Second, John B. Moore & Son, Sharp's Emperor, | 1 00 |

| | |
|---|--------|
| NATIVE GRAPES.—Six bunches of any variety, John B. Moore & Son, | |
| Moore's Early, | \$2 00 |
| Second, J. W. Talbot, Cottage, | 1 00 |

Gratuities:—

| | |
|--|------|
| C. E. Grant, Grapes and Pears, | 1 00 |
| Horace Eaton, Plums, | 1 00 |
| F. J. Dutcher, " | 1 00 |
| Samuel Hartwell, " and Apples, | 1 00 |
| B. G. Smith, Grapes, | 1 00 |

SEPTEMBER 8.

| | | |
|--|--|------|
| APPLES.—Gravenstein, Francis Smith, | | 2 00 |
| Second, Samuel Hartwell, | | 1 00 |
| Porter, Samuel Hartwell, | | 2 00 |
| Second, L. W. Weston, | | 1 00 |
| Any other variety, Samuel Hartwell, Holden, | | 2 00 |
| Second, " " Pumpkin Sweet, | | 1 00 |
| PEARS.—Andrews, Mrs. Mary Langmaid, | | 2 00 |
| Second, Charles F. Curtis, | | 1 00 |
| Boussock, Horace Eaton, | | 2 00 |
| Second, C. N. Brackett, | | 1 00 |
| Any other variety, Hovey & Co., Hanna's, | | 2 00 |
| Second, Warren Fenno, Esperine, | | 1 00 |
| PEACHES.—Collection, Samuel Hartwell, | | 3 00 |
| PLUMS.—Collection, not less than four varieties, Horace Eaton, | | 3 00 |
| Second, John B. Moore & Son, | | 2 00 |
| Any one variety, John B. Moore & Son, Yellow Gage, | | 2 00 |
| Second, F. J. Dutcher, McLaughlin, | | 1 00 |
| NATIVE GRAPES.—Six bunches of Delaware, Cephas H. Brackett, | | 2 00 |
| Second, Horace Partridge, | | 1 00 |
| Hartford, Cephas H. Brackett, | | 2 00 |
| Second, T. M. Davis, | | 1 00 |
| Moore's Early, John B. Moore & Son, | | 2 00 |
| Second, Samuel Hartwell, | | 1 00 |
| Any other variety, B. G. Smith, Creveling, | | 2 00 |
| Second, S. G. Damon, Adirondac, | | 1 00 |

Gratuity:—

| | |
|--|------|
| C. E. Grant, Peaches, Pears, and Apples, | 1 00 |
|--|------|

ANNUAL EXHIBITION.

SEPTEMBER 18, 19, 20, AND 21.

Special Prize offered by George A. Stone, Rochester, N. Y.

| | |
|--|---------|
| NATIVE GRAPES.—Twelve bunches of Pocklington, John Charlton, | |
| Rochester, N. Y., | \$75 00 |
| Six bunches, Joseph S. Chase, | 25 00 |

Special Prizes offered by the Society.

| | |
|---|--------|
| Twelve Gravenstein Apples, Samuel Hartwell, | \$5 00 |
| Twelve Bartlett Pears, Mrs. Mary Langmaid, | 5 00 |
| Twelve Peaches of any variety, Samuel Hartwell, Crawford's Early, | 5 00 |
| Twelve bunches Native Grapes of any variety, John B. Moore & Son, Moore's Early, | 5 00 |

Regular Prizes.

| | |
|---|------|
| APPLES.—Baldwin, John Cummings, | 3 00 |
| Second, Mrs. A. M. Winn, | 2 00 |
| Third, C. L. Weston, | 1 00 |
| Danvers Sweet, John Cummings, | 2 00 |
| Second, C. N. Brackett, | 1 00 |
| Dutch Codlin, Lemuel Clapp, | 2 00 |
| Holden, Samuel Hartwell, | 2 00 |
| Gravenstein, Warren Heustis, | 3 00 |
| Second, Samuel Hartwell, | 2 00 |
| Third, Lemuel Clapp, | 1 00 |
| Hubbardston, L. W. Weston, | 3 00 |
| Second, Samuel Hartwell, | 2 00 |
| Third, M. W. Chadbourne, | 1 00 |
| Hunt, Samuel Hartwell, | 2 00 |
| Second, C. N. Brackett, | 1 00 |
| Lady's Sweet, Warren Fenno, | 2 00 |
| Lyscom, Samuel Hartwell, | 2 00 |
| Northern Spy, John B. Turner, | 2 00 |
| Second, Samuel Hartwell, | 1 00 |
| Porter, Mrs. A. M. Winn, | 2 00 |
| Second, Samuel Hartwell, | 1 00 |
| Pumpkin, George W. Stevens, | 2 00 |
| Second, Lemuel Clapp, | 1 00 |
| Rhode Island, John L. D'Wolf, | 3 00 |
| Second, C. N. Brackett, | 2 00 |
| Third, Samuel Hartwell, | 1 00 |
| Roxbury, John L. D'Wolf, | 3 00 |
| Second, Mrs. M. T. Goddard, | 2 00 |
| Third, C. N. Brackett, | 1 00 |
| Tompkins King, Samuel Hartwell, | 2 00 |
| Second, Hovey & Co., | 1 00 |
| Tolman Sweet, J. T. Foster, | 3 00 |
| Second, Josiah Crosby, | 2 00 |
| Third, Lemuel Clapp, | 1 00 |
| Washington Royal, Josiah Crosby, | 2 00 |
| Washington Strawberry, Lemuel Clapp, | 2 00 |
| Second, Warren Fenno, | 1 00 |
| Any other variety, Samuel Hartwell, Gloria Mundi, | 2 00 |
| Second, Samuel Hartwell, Pound Sweet, | 1 00 |

| | |
|--|--------|
| CRAB APPLES.—Hyslop, Cephas H. Brackett, | \$2 00 |
| Second, Mrs. Austin W. Ward, | 1 00 |
| Transcendent, Warren Fenno, | 2 00 |
| PEARS.—Angouleme, John McClure, | 3 00 |
| Second, W. S. Janvrin, | 2 00 |
| Third, Warren Fenno, | 1 00 |
| Anjou, Mrs. Mary Langmaid, | 3 00 |
| Second, W. S. Janvrin, | 2 00 |
| Third, C. N. Brackett, | 1 00 |
| Bartlett, Mrs. Mary Langmaid, | 3 00 |
| Second, N. D. Harrington, | 2 00 |
| Third, George S. Harwood, | 1 00 |
| Bosc, Mrs. Mary Langmaid, | 3 00 |
| Second, Warren Fenno, | 2 00 |
| Third, Charles F. Curtis, | 1 00 |
| Boussock, George S. Harwood, | 2 00 |
| Second, Horace Eaton, | 1 00 |
| Clairgeau, W. P. Plimpton, | 3 00 |
| Second, Mrs. Mary Langmaid, | 2 00 |
| Third, Jesse Haley, | 1 00 |
| Comice, Horace Eaton, | 2 00 |
| Second, Warren Fenno, | 1 00 |
| Dana's Hovey, I. D. White, | 3 00 |
| Second, E. W. Wood, | 2 00 |
| Third, Hovey & Co., | 1 00 |
| Diel, A. S. McIntosh, | 2 00 |
| Second, Walker & Co., | 1 00 |
| Hardy, Mrs. H. P. Kendrick, | 2 00 |
| Second, Jesse Haley, | 1 00 |
| Goodale, C. E. Grant, | 2 00 |
| Second, Marshall P. Wilder, | 1 00 |
| Howell, Jesse Haley, | 2 00 |
| Second, B. G. Smith, | 1 00 |
| Lawrence, Mrs. Mary Langmaid, | 2 00 |
| Second, Warren Fenno, | 1 00 |
| Louise Bonne of Jersey, George S. Harwood, | 2 00 |
| Second, Mrs. Mary Langmaid, | 1 00 |
| Lucrative, Mrs. Mary Langmaid, | 2 00 |
| Second, Horace Partridge, | 1 00 |
| Marie Louise, Warren Fenno, | 2 00 |
| Second, Walker & Co., | 1 00 |
| Merriam, Charles F. Curtis, | 2 00 |
| Second, Marshall P. Wilder, | 1 00 |
| Nelis, Warren Fenno, | 2 00 |
| Second, T. M. Davis, | 1 00 |
| Onondaga, Marshall P. Wilder, | 2 00 |
| Second, Horace Eaton, | 1 00 |

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|---|--------|
| Paradise, William A. Crafts, | \$2 00 |
| Second, Hovey & Co., | 1 00 |
| Seckel, George S. Harwood, | 3 00 |
| Second, John L. Bird, | 2 00 |
| Third, George E. Peters, | 1 00 |
| Sheldon, Mrs. H. P. Kendrick, | 3 00 |
| Second, George S. Harwood, | 2 00 |
| Third, Mrs. Mary Langmaid, | 1 00 |
| Souvenir du Congrès, B. G. Smith, | 2 00 |
| Second, Marshall P. Wilder, | 1 00 |
| St. Michael Archangel, Walker & Co., | 2 00 |
| Second, T. M. Davis, | 1 00 |
| Superfin, Warren Fenno, | 2 00 |
| Second, E. W. Wood, | 1 00 |
| Urbaniste, Mrs. Mary Langmaid, | 2 00 |
| Second, John L. Bird, | 1 00 |
| Vicar, A. S. McIntosh, | 2 00 |
| Second, Warren Fenno, | 1 00 |
| Any other variety, Marshall P. Wilder, Clapp's Favorite, | 2 00 |
| Second, Augustus Bacon, Flemish Beauty, | 1 00 |
| PEACHES.—Crawford's Early, Samuel Hartwell, | 2 00 |
| Second, Elijah H. Luke, | 1 00 |
| Crawford's Late, Samuel Hartwell, | 2 00 |
| Foster, Samuel Hartwell, | 2 00 |
| Second, John B. Moore & Son, | 1 00 |
| Any other variety, A. W. Felton, Yellow Rareripe, | 2 00 |
| Second, Samuel Hartwell, Grosse Mignonne, | 1 00 |
| NECTARINES.—Warren Fenno, | 2 00 |
| PLUMS.—Collection of not less than four varieties, Samuel Hartwell, | 4 00 |
| Second, John B. Moore & Son, | 3 00 |
| Any one variety, B. G. Smith, Coe's Golden, | 2 00 |
| Second, Samuel Hartwell, Jefferson, | 1 00 |
| NATIVE GRAPES.—Six bunches of Brighton, D. A. Wasson, | 2 00 |
| Second, John McFarland, | 1 00 |
| Concord, John B. Moore & Son, | 2 00 |
| Second, Cephas H. Brackett, | 1 00 |
| Delaware, Joseph S. Chase, | 2 00 |
| Second, John B. Moore & Son, | 1 00 |
| Massasoit, John B. Moore & Son, | 2 00 |
| Second, Cephas H. Brackett, | 1 00 |
| Moore's Early, Horace Eaton, | 2 00 |
| Second, John B. Moore & Son, | 1 00 |
| Wilder, Joseph S. Chase, | 2 00 |
| Second, Cephas H. Brackett, | 1 00 |
| Worden, Samuel Hartwell, | 2 00 |
| Any other variety, John B. Moore & Son, Iona Seedling, | 2 00 |
| Second, Samuel Hartwell, Norwood, | 1 00 |

| | |
|--|--------|
| FOREIGN GRAPES.—Four varieties, two bunches of each, John S. | |
| Farlow, | \$8 00 |
| Second, Elijah H. Luke, | 6 00 |
| Third, Benjamin G. Smith, | 4 00 |
| Two bunches of Black Hamburg, George Higginson, | 4 00 |
| Second, John S. Farlow, | 3 00 |
| Third, C. E. Grant, | 2 00 |
| Wilmot's Hamburg, John S. Farlow, | 4 00 |
| Second, George Higginson, | 3 00 |
| Muscat of Alexandria, John S. Farlow, | 5 00 |
| Any other variety, John S. Farlow, Pope's Hamburg, | 5 00 |
| Second, George Higginson, White Frontignan, | 4 00 |
| CRANBERRIES.—Half-peck, A. M. Tilley, | 2 00 |

Gratuities :—

| | |
|---|------|
| Francis Smith, Gravenstein Apples, | 1 00 |
| Warren Fenno, Pears and Apples, | 2 00 |
| W. A. Morse, " " | 2 00 |
| L. W. Weston, " " | 2 00 |
| C. E. Grant, " " | 3 00 |
| Samuel Hartwell, " " | 1 00 |
| I. D. White, Pears, | 3 00 |
| M. W. Chadbourne, Pears, | 2 00 |
| C. N. Brackett, " | 2 00 |
| William T. Hall, " | 2 00 |
| John Cummings, " | 1 00 |
| Augustus Bacon, " | 1 00 |
| Horace Partridge, " | 1 00 |
| Hovey & Co., " | 1 00 |
| Marshall P. Wilder, " | 1 00 |
| E. S. Converse, " | 1 00 |
| Francis B. Hayes, " | 1 00 |
| John S. Farlow, Foreign Grapes, | 8 00 |
| B. G. Smith, " " | 1 00 |
| Jonathan Mann, Hamburg Grapes, | 1 00 |
| William Richardson, Concord Grapes, | 1 00 |
| G. W. Jameson, Barberries, | 1 00 |
| William Doran & Son, Raspberries, | 1 00 |
| O. M. Holmes, Cranberries, | 1 00 |
| John B. Moore, Display of the Francis B. Hayes Grape, Silver Medal. | |

SEPTEMBER 29.

Gratuities :—

| | |
|---|------|
| N. D. Harrington, Pears, | 1 00 |
| D. W. Lothrop, Seedling Pear, | 1 00 |
| S: G. Stone, Isabella Grapes, | 1 00 |

OCTOBER 6.

| | |
|---|--------|
| APPLES.—Gravenstein, Francis Smith, | \$2 00 |
| Second, Samuel Hartwell, | 1 00 |
| Porter, Francis Smith, | 2 00 |
| Second, C. W. Grant, | 1 00 |
| Any other variety, Lemuel Clapp, Washington Strawberry, | 2 00 |
| Second, Samuel Hartwell, Hubbardston, | 1 00 |
| PEARS.—Angouleme, Mrs. H. P. Kendrick, | 2 00 |
| Second, John McClure, | 1 00 |
| Bosc, George S. Harwood, | 2 00 |
| Second, Warren Fenno, | 1 00 |
| Clairgeau, W. P. Plimpton, | 2 00 |
| Second, Mrs. Mary Langmaid, | 1 00 |
| Comice, George S. Harwood, | 2 00 |
| Second, Warren Fenno, | 1 00 |
| Louise Bonne of Jersey, George S. Harwood, | 2 00 |
| Second, Mrs. Mary Langmaid, | 1 00 |
| Seckel, P. Kenney, | 2 00 |
| Second, George S. Harwood, | 1 00 |
| Sheldon, Mrs. H. P. Kendrick, | 2 00 |
| Second, George S. Harwood, | 1 00 |
| Superfin, Warren Fenno, | 2 00 |
| Second, Augustus Bacon, | 1 00 |
| Urbaniste, John L. Bird, | 2 00 |
| Second, Mrs. Mary Langmaid, | 1 00 |
| Any other variety, A. S. McIntosh, Diel, | 2 00 |
| Second, C. E. Grant, Goodale, | 1 00 |
| QUINCES.—Benjamin G. Smith, | 2 00 |
| Second, Horace Eaton, | 1 00 |
| NATIVE GRAPES.—Six bunches of Brighton, Horace Eaton, | 2 00 |
| Second, Joseph S. Chase, | 1 00 |
| Concord, John B. Moore & Son, | 2 00 |
| Second, Horace Eaton, | 1 00 |
| Delaware, E. Snow, | 2 00 |
| Second, Joseph S. Chase, | 1 00 |
| Iona, John B. Moore & Son, | 2 00 |
| Second, B. G. Smith, | 1 00 |
| Isabella, J. V. Wellington, | 2 00 |
| Second, B. G. Smith, | 1 00 |
| Massasoit, Horace Eaton, | 2 00 |
| Moore's Early, John B. Moore & Son, | 2 00 |
| Second, Horace Eaton, | 1 00 |
| Wilder, John B. Moore & Son, | 2 00 |
| Second, Horace Eaton, | 1 00 |
| Any other variety, John B. Moore & Son, Francis B. Hayes, | 2 00 |
| Second, C. E. Grant, Catawba, | 1 00 |

FOREIGN GRAPES.—Two bunches of any variety, John L. Gardner,
 Black Hamburg, \$3 00
 Second, E. W. Wood, Wilmot's Hamburg, 2 00

Gratuities:—

T. L. Perkins, Apples, 1 00
 C. W. Grant, " 1 00
 C. E. Grant, Apples and Pears, 1 00
 Samuel Hartwell, Apples and Peaches, 1 00
 Francis Smith, Apples, Pears, and Peaches, 1 00
 A. S. McIntosh, Pears, 2 00
 Warren Fenno, Pears, 2 00
 M. W. Chadbourne, Pears and Grapes, 1 00
 B. G. Smith, Grapes, 1 00
 William H. Wilcox, Grapes, 1 00
 John B. Moore & Son, Peaches, 1 00
 A. J. Bigelow, Concord Grapes, Silver Medal.

NOVEMBER 8 AND 9.

French Premiums.

APPLES.—Baldwin, John Cummings, 2 00
 Second, J. T. Foster, 1 00
 Hubbardston, L. W. Weston, 2 00
 Second, M. W. Chadbourne, 1 00
 Hunt, Samuel Hartwell, 2 00
 Lady's Sweet, Warren Fenno, 2 00
 Northern Spy, Samuel Hartwell, 2 00
 Rhode Island, A. S. McIntosh, 2 00
 Roxbury, Cephas H. Brackett, 2 00
 Tolman Sweet, J. T. Foster, 2 00
 Tompkins King, Samuel Hartwell, 2 00
 Second, John Parker, 1 00
 PEARS.—Angouleme, Warren Fenno, 2 00
 Second, John McClure, 1 00
 Anjou, Mrs. Mary Langmaid, 2 00
 Second, A. S. McIntosh, 1 00
 Comice, John C. Park, 2 00
 Second, Warren Fenno, 1 00
 Dana's Hovey, Warren Fenno, 2 00
 Second, Hovey & Co., 1 00
 Glout Morceau, Augustus Bacon, 2 00
 Second, A. S. McIntosh, 1 00
 Josephine of Malines, Warren Fenno, 2 00
 Langelier, C. E. Grant, 2 00
 Second, A. S. McIntosh, 1 00
 Lawrence, Mrs. Mary Langmaid, 2 00
 Second, John McClure, 1 00

| | |
|--|--------|
| Nelis, T. M. Davis, | \$2 00 |
| Second, Warren Fenno, | 1 00 |
| Vicar, Walker & Co., | 2 00 |
| Second, A. S. McIntosh, | 1 00 |
| Any other variety, A. S. McIntosh, Diel, | 2 00 |
| Second, Augustus Bacon, Easter Beurre, | 1 00 |

Gratuities : —

| | |
|--------------------------------------|------|
| C. W. Grant, Apples, | 1 00 |
| Samuel Hartwell, Apples, | 1 00 |
| Marshall P. Wilder, Pears, | 3 00 |
| Warren Fenno, " | 2 00 |
| M. W. Chadbourne, " | 2 00 |
| C. E. Grant, " | 1 00 |
| Mrs. Mary Gardner, " | 1 00 |
| Augustus Bacon, " | 1 00 |
| A. S. McIntosh, " | 1 00 |
| Horace Eaton, Quinces, | 1 00 |

REPORT

OF THE

COMMITTEE ON VEGETABLES,

FOR THE YEAR 1883.

By CHARLES N. BRACKETT, CHAIRMAN.

The closing of another exhibition season reminds us of a duty which, by custom and in conformity to our By-Laws, we owe the Society, of rendering to it an account of our labors for the year, together with the amount of awards in prizes and gratuities which have been made.

In reviewing the season, which has in many respects been a most remarkable one, your Committee cannot but feel gratified at the progress made, and the good degree of success which has attended the efforts of contributors under so many disadvantageous circumstances.

The excessive drought and scorching sun of the past summer were not propitious for the production of fine specimens of vegetable growth, and the effect was shown in a marked manner at some of our weekly exhibitions. But, in spite of these discouragements, the displays, on the whole, have been most gratifying, and no lack of interest has been manifested on the part of contributors.

The show of forced vegetables, during the early portion of the season, as has been the case for several years past, was confined to a few contributors. To President Hayes, Josiah Crosby, and Cephas H. Brackett, we have been indebted for the occasional exhibition of choice specimens during the months of February and

March. These gentlemen were the only contributors previous to the opening exhibition, March 22, and continued to show specimens of Rhubarb, Cucumbers, Mushrooms, Lettuce, Radishes, Dandelions, Tomatoes, and Parsley, from week to week all through their season. At the Azalea Show, the exhibition of vegetables grown under glass was much better than last year, all the first and most of the second prizes being awarded.

The general weekly displays during the season, though satisfactory, were not so extensive perhaps as in some former years, which was, no doubt, owing mainly to the long continued drought.

The earliest specimens of Peas were shown by M. W. Chadbourne, June 16. The varieties were Bliss's American Wonder, and Breck's Excelsior. The first and second prizes were both awarded to the American Wonder, a first-class pea, and a great acquisition.

The first and second prizes for potatoes, July 14, were taken with Hebron and Clark. The exhibition of Sweet Corn has not been as abundant or as good as usual, the late varieties having been more or less injured by the dry weather. The first and second prizes were awarded July 21 for Marblehead. No variety equal to it in quality can compete with this corn in earliness, but, on account of its great liability to smut, it is considered unprofitable by many who have grown it largely for market the past two or three seasons. The first prize for Early Crosby corn was taken by Josiah Crosby, July 28.

The first exhibition of Tomatoes, of out-door growth, was made July 14 by George Hill; the variety was the Emery. The specimens were exceedingly fine ones. With many who grow the tomato largely for market, the Emery is rapidly taking the place of the old Boston Market.

July 21 being prize day, the first prize was awarded for Acme. This variety also took first and second prizes at all succeeding shows during the season, in competition with Paragon, Emery, Boston Market, Trophy, and Livingston's Perfection. Livingston's Perfection and Favorite appear to be identical; both are subject to blight, and neither, in our estimation, is any improvement on the Acme or Paragon. After Mr. Livingston introduced the Acme, we think there was very little room left for improvement, either in form or quality. It is also worthy of note that, while a

host of so-called new or improved varieties appear and disappear with every season, this variety has gone on steadily increasing in favor from its first introduction, until it is now almost universally acknowledged to be the best and most valuable of all. The Acme, Paragon, and Emery, we consider the best three of the many varieties before the public. If confined to but one variety, we should choose the Acme.

The season has been favorable for Melons, and they have been shown in great perfection. August 18 the first prize was awarded to George Hill, for Greenflesh, and he again received the same prize September 1. As usual, his specimens were superb, and in the best possible condition, as some of your Committee can testify.

The shows of Celery, Egg Plants, and Cauliflowers were worthy of special mention. Josiah Crosby's splendid specimens of celery at the Annual Exhibition took both the special and first regular prizes. John Cummings did the same with cauliflowers, his specimens of Early Dawn being the best we have ever seen; they attracted the attention of all who entered the Hall. Some remarkably fine specimens of Egg Plant were exhibited during the season by Joseph G. Coolidge and George D. Moore.

At the Annual Exhibition, we have to report the largest and best show of Potatoes ever made by this Society. This crop has, the past season, been more than an average one, both in quality and yield, and was sufficiently advanced when the dry weather set in to escape the drought. There were ninety-five dishes in competition for the fifteen prizes, which, it is hardly necessary to say, were all awarded. The largest contributor was John Cummings, who showed a fine collection of thirty varieties. Aaron Low was next, with a collection of twenty varieties. The first prize for the best four varieties was taken by Mr. Cummings, who also took the first prize for the best dish of Clark, and the first for "any other variety" was awarded him for King. For Rose, Samuel Hartwell was the successful competitor, and John B. Moore was first for Hebron.

It is one of the easiest things in the world to raise new varieties of the potato from seed, but it is not so easy to make advances on the best varieties in cultivation. Experience shows that the most hopeful and promising seedlings at the start, often prove worthless in the course of further experiment, and the time and labor of cultivating many thousand seedlings is required to secure a single

variety in all respects worthy of cultivation. Among the newest of the new in the way of seedling potatoes, at the Annual Exhibition, were the Advance and North Star, from Albert Bresee, of Hubbardton, Vt. For many years Mr. Bresee's name has been made familiar throughout the country as the originator of the Early Rose and other valuable varieties now in general cultivation. Mr. Bresee's seedling, Advance, was first shown here by him at the Annual Exhibition in 1882, and favorably noticed in our report of that year. Those who have grown it in this vicinity the past season all speak of it in terms of unqualified praise. Mr. Bresee says, in regard to these two seedlings, "The Advance and North Star originated in 1874 or 1875, from a seed ball of the Early Rose, fertilized with the Climax by planting them in alternate hills with the Rose. I have never found any seed balls on the Early Rose when planted alone. For many years I have grown seedlings from the Rose in the manner described, and have succeeded in obtaining two or three varieties which I fully believe to be of much value. As to the time of ripening, some seasons the Advance ripens quite as early as the Rose, at others a *very few* days later. Charles Downing writes me, 'the Advance is a little earlier, and of better quality than the Rose.' J. J. H. Gregory writes, 'In yield and size it rather surpasses the Rose, and it is earlier.' The North Star is a very strong grower, large yielder, and of first quality, and should not be planted on very rich or moist land." Mr. Bresee further says: "Some years ago I tried to make some arrangement with a noted dealer in seed potatoes for the sale of these seedlings, but, as I could not make any trade with him without giving him all the profits, I came home and gave them out without making one dollar, so you can see that I have no axe to grind."

From our own experience, having grown a small quantity of the Advance by way of trial, the past season, we are free to say that we think it possesses merits of a high order, and we feel satisfied that, as soon as known, it will take its place among our most popular varieties.

Before closing this report, we would call the attention of contributors to important changes in the Schedule of Prizes for the coming year, and especially to the number, or quantity of specimens, which will be required in future where peas, potatoes, onions, etc., are exhibited.

The amount of \$514 has been awarded in prizes and gratuities the past year, leaving an unexpended balance of \$16 to be returned to the treasury.

Annexed will be found a list of the awards which have been made by your Committee.

Respectfully submitted,

C. N. BRACKETT, *Chairman.*

PRIZES AND GRATUITIES AWARDED FOR VEGETABLES.

FEBRUARY 3.

Gratuity :—

Francis B. Hayes, Rhubarb, \$1 00

FEBRUARY 10.

Gratuities :—

Josiah Crosby, Celery, 2 00

Francis B. Hayes, Rhubarb, 1 00

FEBRUARY 17.

Gratuity :—

Cephas H. Brackett, Cucumbers and Rhubarb, 3 00

FEBRUARY 24.

Gratuity :—

Josiah Crosby, Lettuce and Radishes, 2 00

MARCH 3.

Gratuity :—

Josiah Crosby, Lettuce and Radishes, 2 00

MARCH 10.

Gratuity :—

Josiah Crosby, Lettuce, 1 00

MARCH 17.

Gratuity :—

Josiah Crosby, Radishes and Lettuce, 2 00

AZALEA AND ROSE EXHIBITION.

MARCH 22.

RADISHES.—Four bunches of Turnip Rooted, Josiah Crosby, . . . \$3 00

Second, George F. Stone, 2 00

Long Scarlet, Josiah Crosby, 3 00

CUCUMBERS.—Pair, Cephas H. Brackett, 3 00

DANDELIONS.—Peck, George F. Stone, 2 00

| | |
|---|--------|
| LETTUCE.—Four heads, J. Crosby, | \$3 00 |
| Second, George F. Stone, | 2 00 |
| PARSLEY.—Two quarts, William Patterson, | 2 00 |

Gratuities :—

| | |
|--|------|
| C. H. Brackett, Mushrooms and Cucumbers, | 2 00 |
| C. M. Atkinson, Parsley, | 1 00 |

MARCH 31.

Gratuity :—

| | |
|-----------------------------------|------|
| Josiah Crosby, Lettuce, | 1 00 |
|-----------------------------------|------|

APRIL 14.

Gratuity :—

| | |
|--|------|
| Francis B. Hayes, Cucumbers and Lettuce, | 2 00 |
|--|------|

APRIL 21.

Gratuity :—

| | |
|--|------|
| C. H. Brackett, Mushrooms and Cucumbers, | 2 00 |
|--|------|

APRIL 28.

Gratuity :—

| | |
|--------------------------------------|------|
| George W. Pierce, Lettuce, | 2 00 |
|--------------------------------------|------|

MAY 5.

Gratuity :—

| | |
|--------------------------------------|------|
| Josiah Crosby, Dandelions, | 1 00 |
|--------------------------------------|------|

MAY 12.

Gratuities :—

| | |
|--|------|
| John B. Moore, Asparagus, | 2 00 |
| Samuel Hartwell, " | 1 00 |
| Josiah Crosby, Carrots and Radishes, | 1 00 |

MAY 19.

Gratuities :—

| | |
|---|------|
| C. H. Brackett, Tomatoes and Rhubarb, | 2 00 |
| Samuel Hartwell, Asparagus and Rhubarb, | 1 00 |

MAY 26.

Gratuities :—

| | |
|--------------------------------------|------|
| Josiah Crosby, Collection, | 3 00 |
| C. H. Brackett, " | 2 00 |
| C. W. Grant, Rhubarb, | 1 00 |

JUNE 2.

Gratuities :—

| | |
|---|------|
| C. H. Brackett, Tomatoes and Cucumbers, | 1 00 |
| M. W. Chadbourne, Rhubarb, | 1 00 |
| Marshall P. Wilder, Marquis of Lorne Cucumbers, | 1 00 |

JUNE 9.

| | |
|--|--------|
| CARROTS.—Twelve Short Scarlet, J. Crosby, | \$2 00 |
| RADISHES.—Twelve Turnip Rooted, J. Crosby, | 2 00 |
| ASPARAGUS.—Four bunches, J. B. Moore, | 2 00 |
| Second, L. W. Weston, | 1 00 |
| CUCUMBERS.—Pair, C. B. Lancaster, | 2 00 |
| LETTUCE.—Four heads, Josiah Crosby, | 2 00 |
| Second, Warren Heustis, | 1 00 |
| RHUBARB.—Twelve stalks, Samuel Hartwell, | 2 00 |

Gratuities :—

| | |
|---------------------------------------|------|
| Samuel Hartwell, Asparagus, | 1 00 |
| Josiah Crosby, Collection, | 2 00 |
| C. H. Brackett, Tomatoes. | 1 00 |

JUNE 13.

Gratuity :—

| | |
|-------------------------------------|------|
| Josiah Crosby, Cucumbers, | 1 00 |
|-------------------------------------|------|

JUNE 16.

Gratuity :

| | |
|-----------------------------------|------|
| M. W. Chadbourne, Peas, | 2 00 |
|-----------------------------------|------|

JUNE 23.

Gratuities :—

| | |
|--|------|
| M. W. Chadbourne, Cucumbers, | 1 00 |
| C. B. Lancaster, " | 1 00 |

ROSE AND STRAWBERRY SHOW.

JUNE 26.

Whitcomb Prizes.

| | |
|--|--------|
| BEETS.—Twelve Turnip Rooted, Warren Heustis, | \$2 00 |
| Twelve Egyptian, Josiah Crosby, | 2 00 |
| Second, Warren Heustis, | 1 00 |
| ONIONS.—Twelve, Josiah Crosby, | 2 00 |
| CUCUMBERS.—Pair, E. W. Wood, | 2 00 |
| Second, Josiah Crosby, | 1 00 |
| CABBAGES.—Four, Josiah Crosby, | 2 00 |
| Second, Warren Heustis, | 1 00 |
| LETTUCE.—Four heads, John L. Gardner, | 2 00 |
| PEAS.—Peck, Samuel Hartwell, | 2 00 |
| Second, Samuel G. Stone, | 1 00 |

Gratuities :—

| | |
|---|------|
| C. H. Brackett, Tomatoes, | 1 00 |
| Samuel Hartwell, Laxton's Alpha Peas, | 1 00 |

JULY 7.

| | |
|---|--------|
| ONIONS.—Twelve, Josiah Crosby, | \$2 00 |
| SQUASHES.—Four Long Warded, Warren Heustis, | 2 00 |
| CABBAGES.—Four, Josiah Crosby, Henderson's Early, | 2 00 |
| Second, Warren Heustis, “ “ | 1 00 |

Gratuity :—

| | |
|--|------|
| H. S. Messenger, Marquis of Lorne Cucumbers, | 1 00 |
|--|------|

JULY 14.

| | |
|---|------|
| POTATOES.—Peck, L. W. Weston, Hebron, | 3 00 |
| Second, C. B. Lancaster, Clark, | 2 00 |

Gratuities :—

| | |
|---|------|
| Samuel Hartwell, Champion Peas, | 1 00 |
| George Hill, Emery Tomatoes, | 2 00 |
| C. E. Grant, Collection of Beans, | 2 00 |

JULY 21.

| | |
|---|------|
| CABBAGES.—Four Drumhead, Josiah Crosby, | 3 00 |
| TOMATOES.—Twelve, C. N. Brackett, Acme, | 3 00 |
| Second, S. Hartwell, Boston Market, | 2 00 |
| SWEET CORN.—Twelve ears, S. Hartwell, Marblehead, | 3 00 |
| Second, C. N. Brackett, “ “ | 2 00 |

Gratuity :—

| | |
|---------------------------------------|------|
| M. W. Chadbourne, Potatoes, | 1 00 |
|---------------------------------------|------|

JULY 28.

| | |
|---|------|
| SQUASHES.—Four Marrow, Josiah Crosby, | 3 00 |
| Second, Warren Heustis, | 2 00 |
| SWEET CORN.—Twelve ears, J. Crosby, Crosby, | 3 00 |
| Second, L. W. Weston, Weston's Early, | 2 00 |
| Third, C. E. Grant, Crosby, | 1 00 |
| TOMATOES.—Twelve, Samuel Hartwell, Acme, | 3 00 |
| Second, C. N. Brackett, “ “ | 2 00 |

Gratuities :—

| | |
|---|------|
| Francis B. Hayes, Collection of Peas, | 2 00 |
| M. W. Chadbourne, Hebron Potatoes, | 1 00 |
| L. W. Weston, “ “ | 1 00 |
| Warren Heustis, Rose Potatoes, | 1 00 |

AUGUST 4.

| | |
|--|------|
| SQUASHES.—Four Marrow, Josiah Crosby, | 2 00 |
| Second, Warren Heustis, | 1 00 |
| SWEET CORN.—Twelve ears, L. W. Weston, Weston's Early, | 2 00 |
| Second, Samuel Hartwell, Crosby, | 1 00 |

| | |
|---|--------|
| TOMATOES.—Twelve, C. N. Brackett, Acme, | \$3 00 |
| Second, Samuel Hartwell, “ | 2 00 |
| Third, C. N. Brackett, Perfection, | 1 00 |

Gratuities :—

| | |
|---|------|
| Samuel Hartwell, Potatoes and Tomatoes, | 1 00 |
| Warren Heustis, “ “ Peppers, | 1 00 |

AUGUST 11.

| | |
|---|------|
| GREENFLESH MELONS.—Four, George Hill, | 3 00 |
| TOMATOES.—Twelve Acme, C. N. Brackett, | 2 00 |
| Second, Samuel Hartwell, | 1 00 |
| Emery, Samuel Hartwell, | 2 00 |
| Second, C. N. Brackett, | 1 00 |
| Any other variety, Samuel Hartwell, Perfection, | 2 00 |
| Second, Samuel Hartwell, Trophy, | 1 00 |
| EGG PLANT.—Four Round Purple, Joseph G. Coolidge, | 3 00 |
| Second, George Hill, | 2 00 |

Gratuities :—

| | |
|--|------|
| Josiah Crosby, Onions, | 1 00 |
| C. H. Cutler, Celery, | 1 00 |
| Samuel Hartwell, Collection, | 3 00 |
| C. E. Grant, “ | 2 00 |
| M. B. Faxon, “ | 1 00 |

AUGUST 18.

| | |
|---|------|
| GREENFLESH MELONS.—Four, George Hill, | 2 00 |
| MUSKMELONS.—Four, Samuel Hartwell, | 2 00 |
| EGG PLANT.—Four, J. G. Coolidge, | 2 00 |
| Second, Daniel Duffley, | 1 00 |

Gratuities :—

| | |
|--|------|
| C. E. Grant, Lima Beans, | 1 00 |
| C. N. Brackett, Tomatoes, | 1 00 |
| J. G. Coolidge, “ | 1 00 |
| Samuel Hartwell, Collection, | 3 00 |
| Francis B. Hayes, “ | 1 00 |

AUGUST 25.

| | |
|---|------|
| POTATOES.—Peck, John Cummings, Rose, | 2 00 |
| Second, Samuel Hartwell, Hebron, | 1 00 |
| BEANS.—Large Lima, two quarts, B. G. Smith, | 2 00 |
| Second, C. E. Grant, | 1 00 |
| PEPPERS.—Twelve, Warren Heustis, | 2 00 |
| Second, Horace Eaton, | 1 00 |

Gratuities:—

| | |
|--|--------|
| George Hill, Melons, | \$2 00 |
| M. W. Chadbourne, Melons, | 1 00 |
| E. W. Wood, Lima Beans, | 1 00 |
| Mrs. E. M. Gill, Sweet Corn, | 1 00 |
| Samuel Hartwell, Collection, | 2 00 |
| C. E. Grant, " | 1 00 |

SEPTEMBER 1.

| | |
|--|------|
| WATERMELONS.—Pair, Samuel Hartwell, Black Spanish, | 3 00 |
| Second, " " Mountain Sweet, | 2 00 |
| GREENFLESH MELONS.—Four, George Hill, | 3 00 |
| Second, Samuel Hartwell, | 2 00 |

Gratuities:—

| | |
|---|------|
| C. E. Grant, Lima Beans, | 1 00 |
| W. C. Strong, Ensilage Corn, | 1 00 |
| Francis B. Hayes, Collection, | 1 00 |

SEPTEMBER 8.

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|--|------|
| CAULIFLOWERS.—Four, John Cummings, | 3 00 |
| Second, Samuel Hartwell, | 2 00 |
| CELERY.—Four roots, Josiah Crosby, | 3 00 |

Gratuity:—

| | |
|--|------|
| Samuel G. Stone, Lima Beans, | 1 00 |
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ANNUAL EXHIBITION.

SEPTEMBER 18, 19, 20, AND 21.

Special Prizes.

| | |
|--|--------|
| CAULIFLOWERS.—Best four specimens, and best kept during the exhibition, John Cummings, | \$5 00 |
| CELERY.—Best four specimens, and best kept during the exhibition, Josiah Crosby, | 5 00 |

Regular Prizes.

| | |
|---|------|
| BEETS.—Twelve Turnip Rooted, George F. Stone, | 3 00 |
| Second, Walter Russell, | 2 00 |
| Third, George Hill, | 1 00 |
| CARROTS.—Twelve Long Orange, George Hill, | 3 00 |
| Second, Josiah Crosby, | 2 00 |
| Third, John L. D'Wolf, | 1 00 |
| Intermediate, Josiah Crosby, | 3 00 |
| Second, George Hill, | 2 00 |
| Third, Francis B. Hayes, | 1 00 |

| | |
|---|--------|
| PARSNIPS.—Twelve Long, John L. D'Wolf, | \$3 00 |
| Second, Francis B. Hayes, | 2 00 |
| Third, George Hill, | 1 00 |
| POTATOES.—Four varieties, one peck each, John Cummings, | 4 00 |
| Second, Aaron Low, | 3 00 |
| Third, C. N. Brackett, | 2 00 |
| Clark, John Cummings, | 3 00 |
| Second, Aaron Low, | 2 00 |
| Third, C. B. Lancaster, | 1 00 |
| Hebron, John B. Moore, | 3 00 |
| Second, John Cummings, | 2 00 |
| Third, Samuel Hartwell, | 1 00 |
| Peck of Rose, Samuel Hartwell, | 3 00 |
| Second, John Cummings, | 2 00 |
| Third, J. G. Coolidge, | 1 00 |
| Any other variety, John Cummings, King, | 3 00 |
| Second, Aaron Low, Jones Prize, | 2 00 |
| Third, L. W. Weston, Early Vermont, | 1 00 |
| SALSIFY.—Twelve specimens, John L. D'Wolf, | 3 00 |
| Second, George F. Stone, | 2 00 |
| TURNIPS.—Twelve Flat, George Russell, | 3 00 |
| Second, George F. Stone, | 2 00 |
| Third, John Cummings, | 1 00 |
| Swedish, George F. Stone, | 3 00 |
| Second, Francis B. Hayes, | 2 00 |
| Third, Mrs. M. T. Goddard, | 1 00 |
| ONIONS.—Peck of Danvers, George Hill, | 3 00 |
| Second, John Cummings, | 2 00 |
| Third, George D. Moore, | 1 00 |
| Red, George Hill, | 3 00 |
| Second, John Cummings, | 2 00 |
| Third, Walter Russell, | 1 00 |
| White Portugal, Josiah Crosby, | 3 00 |
| Second, Samuel Hartwell, | 2 00 |
| Third, John Cummings, | 1 00 |
| GREENFLESH MELONS.—Four, C. E. Grant, | 3 00 |
| Second, John Cummings, | 2 00 |
| Third, Warren Heustis, | 1 00 |
| MUSKMELONS.—Four, John Cummings, | 3 00 |
| Third prize to S. A. Merrill, | 1 00 |
| WATERMELONS.—Pair, Sidney Lawrence, Cuban Queen, | 3 00 |
| Second, Samuel Hartwell, | 2 00 |
| Third, " " Black Spanish, | 1 00 |
| SQUASHES.—Four Canada, George Dorr, | 3 00 |
| Second, Josiah Pratt, | 2 00 |
| Third, John L. D'Wolf, | 1 00 |
| Hubbard, John Cummings, | 3 00 |

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|--|--------|
| Second, Walter Russell, | \$2 00 |
| Third, J. G. Coolidge, | 1 00 |
| Marblehead, John Cummings, | 3 00 |
| Marrow, George Hill, | 3 00 |
| Second, Walter Russell, | 2 00 |
| Third, John Cummings, | 1 00 |
| Perfect Gem, C. N. Brackett, | 3 00 |
| Second, John Cummings, | 2 00 |
| Third, Walter Russell, | 1 00 |
| Turban, Aaron Low, | 3 00 |
| Second, John Cummings, | 2 00 |
| Third, Samuel Hartwell, | 1 00 |
| CABBAGES.—Four Drumhead, Samuel Hartwell, | 3 00 |
| Second, John Cummings, | 2 00 |
| Third, C. B. Lancaster, | 1 00 |
| Red, John Cummings, | 3 00 |
| Second, Francis B. Hayes, | 2 00 |
| Savoy, " " " | 3 00 |
| Second, John Cummings, | 2 00 |
| Third, C. B. Lancaster, | 1 00 |
| CAULIFLOWERS.—Four, John Cummings, | 3 00 |
| Second, Samuel Hartwell, | 2 00 |
| CELERY.—Four roots, Josiah Crosby, | 3 00 |
| Second, George D. Moore, | 2 00 |
| ENDIVE.—Four roots, A. F. Allen, | 2 00 |
| LIMA BEANS.—Two quarts, Samuel G. Stone, | 3 00 |
| Second, Benjamin G. Smith, | 2 00 |
| Third, E. W. Wood, | 1 00 |
| CORN.—Sweet, twelve ears, John Cummings, | 3 00 |
| Second, S. A. Merrill, | 2 00 |
| Third, J. G. Coolidge, | 1 00 |
| Field, twenty-five ears, traced, Mrs. M. T. Goddard, | 3 00 |
| Second, C. N. Brackett, | 2 00 |
| Third, Horace Eaton, | 1 00 |
| EGG PLANTS.—Four Round Purple, George D. Moore, | 3 00 |
| Second, J. G. Coolidge, | 2 00 |
| Third, A. F. Allen, | 1 00 |
| TOMATOES.—Three varieties, Aaron Low, | 4 00 |
| Second, S. G. Stone, | 3 00 |
| Third, George W. Pierce, | 2 00 |
| Acme, Twelve specimens, John B. Moore, | 2 00 |
| Second, John Cummings, | 1 00 |
| Emery, George W. Pierce, | 2 00 |
| Second, Mrs. A. M. Winn, | 1 00 |
| Paragon, John Cummings, | 2 00 |
| Second, Samuel G. Stone, | \$1 00 |

| | |
|---|--------|
| Perfection, George W. Pierce, | \$2 00 |
| Second, Francis B. Hayes, | 1 00 |
| Any other variety, Walter Russell, Boston Market, | 2 00 |
| Second, Mrs. A. M. Winn, Livingston's, | 1 00 |
| MARTYNIAS.—Twenty-four specimens, George W. Pierce, | 2 00 |
| Second, C. E. Grant, | 1 00 |
| OKRA.—Twenty-four specimens, A. F. Allen, | 2 00 |
| Second, Mrs. M. T. Goddard, | 1 00 |
| PEPPERS.—Twenty-four, Josiah Crosby, | 3 00 |
| Second, C. N. Brackett, | 2 00 |
| Third, George F. Stone, | 1 00 |

Gratuities :—

| | |
|---|------|
| Warren Heustis, Lettuce, | 1 00 |
| Aaron Low, Collection of Potatoes, | 2 00 |
| Francis B. Hayes, " " | 2 00 |
| Albert Bresee, New Seedling Potatoes, Advance and North Star, | 2 00 |
| E. F. Bowditch, Potatoes, | 1 00 |
| C. E. Grant, Tomatoes, | 1 00 |
| C. N. Brackett, " | 1 00 |
| John Cummings, Collection, | 3 00 |

SEPTEMBER 29.

Gratuity :—

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|------------------------------------|------|
| S. G. Stone, Lima Beans, | 1 00 |
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OCTOBER 6.

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| CAULIFLOWERS.—Four, Samuel Hartwell, | 2 00 |
| CELERY.—Four Roots, Josiah Crosby, | 2 00 |

Gratuity :—

| | |
|--|------|
| Samuel G. Stone, Lima Beans, | 1 00 |
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NOVEMBER 8 AND 9.

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| CAULIFLOWERS.—Four, the second prize to Samuel Hartwell, | 1 00 |
| CELERY.—Four roots, Josiah Crosby, | 2 00 |
| Second, C. E. Grant, | 1 00 |

Gratuity :—

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|---|------|
| Cephas H. Brackett, Tomatoes and Cucumbers, | 2 00 |
|---|------|

REPORT
OF THE
COMMITTEE ON GARDENS,
FOR THE YEAR 1883.

BY JOHN G. BARKER, CHAIRMAN.

We passed the year 1882 without making any report of our doings. Owing to a combination of circumstances beyond our control, we were invited to visit only one place, that of Edward Haskell, at New Bedford, but by some mistake a part of the Committee went on a day that was not understood by Mr. Haskell to be the one intended, so no one met the Committee, and no report was made. During the present year we have visited only two places, though we have the assurance that other invitations would have been extended but for the continued dry weather, by which we all suffered so much.

PINE HILL, THE RESIDENCE OF HON. FRANCIS B. HAYES,
PRESIDENT OF THE SOCIETY.

Our first visit was to Lexington, on the 12th of June, the principal object being to see the Rhododendrons, which were placed in a much larger tent than the old one, in a new location, in a hollow at the right of and beyond the mansion house. The tent is one hundred and fifty feet long and seventy-five wide, and laid out in a neat and tasteful manner, in beds of various forms, with grass walks. Besides the previously large collection, many new and fine varieties of exquisite beauty have been added, and interspersed at different places were large specimen plants of Indian Azaleas, *Bougainvillea glabra*, *Alsophila excelsa*, and *Dra-cænas*, with other foliage and flowering plants, while at each post

was planted a clematis or some other hardy climbing plant. It is only just to say, that on account of the sudden change to warm weather the rhododendrons were not in as good condition as they otherwise would have been, but with a favorable season, and the consummation of the contemplated improvements, the rhododendron tent will be a very attractive and interesting feature of the place.

Near the woods and a little beyond the rhododendron tent, there is building a large stone mansion house, which, when completed and the surroundings improved as proposed, will add greatly to the attractiveness of the estate.

The large pit for the protection of half-hardy plants has been enlarged to twice its former capacity. The value of this pit can hardly be over-estimated, and we repeat what we said in a former report, that the many who have small estates and have not the facilities of a greenhouse, could not do better than to build a pit or partition off a portion of the cellar, where many of the half-hardy plants, so valuable for ornamental purposes, can be protected with very little trouble. In this pit are kept the choice Hybrid Rhododendrons, Indian Azaleas, Hollies, and all half-hardy plants. Hydrangeas, many of which are not hardy, but are valuable for summer decorative purposes, may be safely kept in such a pit, or a cool cellar. Mr. Comley informed us that he gave special attention to ventilation every mild day, keeping it at an average temperature of 38° to 40°, and avoiding all dampness as much as possible.

The grapery was found in a flourishing condition.

All over the grounds additional improvements are constantly being made. We all know that progress marks all the steps of Mr. Hayes, and we hope to have the pleasure of making such notes from time to time as will be of interest to the Society. We hardly need to add that our visit, as on former occasions, was one of much pleasure.

RESIDENCE OF BENJAMIN G. SMITH, CAMBRIDGE.

On the 31st of July the Committee visited the estate of Mr. Smith, on Fayerweather street, Cambridge, which contains about two acres. Mr. Smith retired from business some twenty years ago, and for amusement and recreation has since followed the pursuit which we all so much love and delight in. With what

success his labors have been attended, the numerous exhibitions of his products which you all have witnessed speak for themselves. Mr. Smith has several times taken in the aggregate more prizes for fruits in one year at the Society's exhibitions than any other exhibitor. At the request of the Committee he has furnished us with the following notes, which will be read with interest and will commend themselves to all in like situations.

Mr. Smith says the collection comprises about fifty varieties of Apples, and he commends the Red Astrachan, Williams, Gravenstein, Hubbardston, Baldwin, Garden Royal, Hunt, Mother, Rhode Island, Roxbury, Washington Strawberry, and Foundling. He finds the Hunt more delicious than the Roxbury, and it keeps equally as well. The Garden Royal is one of the best summer dessert apples, standing among apples as Dana's Hovey among pears.

About fifty varieties of Pears are grown, beginning with Doyenné d'Ete, and passing on with Giffard, Clapp's Favorite, Boussock, Howell, Sheldon, Seckel, Urbaniste, Dana's Hovey, Lawrence, etc. All the trees are standards, and many of them, for the sake of economy in room, have several varieties grafted on each without any apparent detriment to fruit or trees. Thinning of the larger kinds is judiciously looked after. The Pound pear is especially commended for culinary purposes; parboiled and then cooked with a little syrup, Mr. Smith has it on his table nearly every day in May and June.

He has four varieties of Peaches, namely, Crawford's Early and Late, George the Fourth, and Coolidge's Favorite, and one variety of Nectarine, but the trees are all short lived, and none have been satisfactory.

Of Quinces there are four varieties, the Orange and Rea's Mammoth being the best. The latter is of very large size, Mr. Smith having taken the first prize at the Autumn Exhibition, October 10, 1882, with twelve fruits, weighing together nine pounds and twelve ounces.

There are nine varieties of Plums,—Coe's Golden, Pond's, Bradshaw, Smith's Orleans, Imperial Gage, Green Gage, Peach, and Bavay's Green Gage. Early in the season the trees are showered with a solution of whale oil soap, which is a preventive of caterpillars, and Mr. Smith thinks it renders the trees and fruit distasteful to other insect depredators. The trees are healthy, and bear fair crops.

There are three varieties of Cherries, which do well, bearing heavy crops, and ripening perfectly. Mr. Smith recommends that dwarf trees should be planted, as they could be more easily protected from the birds.

Of Raspberries there are nine varieties, but the Franconia is preferred, though Mr. Smith speaks of the Souchetti (white) as a favorite berry, and Shaffer's Colossal as a very robust grower and quite prolific.

Among four varieties of Blackberries, the Dorchester is considered best of all.

Mr. Smith has nine varieties of Currants, and thinks the French Transparent the best for table and exhibition purposes. His best currants are produced on bushes on a slope facing north, behind the barn, and where the liquid fertilizing material from the barn cellar finds its way to the garden. He has also shown the Versailles, Victoria, Red Dutch, Dana's Transparent, and Black Naples.

There are eight varieties of foreign and native Gooseberries. This is a favorite fruit with Mr. Smith, and he has cultivated it with great success. The soil in which they are planted is a strong loam over two feet deep, and liberally enriched on the surface each year with cow manure. The location is in a border under the partial shade of apple trees and a high board fence a little further north. Mr. Smith gives us as a secret of success, severe pruning, and early thinning out about two-thirds of the berries; and with hellebore powder the currant worms are guarded against. At the time of our visit many of the varieties were ripe, and the Committee enjoyed a practical test of the success attained. For ten years scarcely an instance of mildew has been seen. The varieties are Whitesmith, of which the specimens were magnificent, Wellington's Glory, Yellow Amber, Glenton Green, Downing, and several unnamed sorts.

Of Strawberries, there are nine varieties. For quality the Herve Davis, Wilder, and Hovey, are considered the leading sorts, but for size and profusion of bearing, the Sharpless is ahead of the others.

Juneberries (*Amelanchier*) and Blueberries, although rather novel as garden fruits, are grown with good success.

Of Hardy Grapes there are thirty-three kinds on trellises, arbors, and stakes. Moore's Early he commends highly for its

many excellent qualities, and for table use he thinks well of the Iona, Brighton, and Eumelan, but informs us that for jellies Mrs. Smith prefers the common wild grape.

The Cold Grapery is a lean-to structure, facing the south; the varieties of grapes planted are Black Hamburg, Victoria Hamburg, Muscat Hamburg, Golden Hamburg, Duchess of Buccleugh, and Lady Downes. It will be noticed that there is quite a variety, which ripen their fruit at different periods of the season; they have all done well together and have not failed to produce a satisfactory crop for eight successive years since they first came into bearing. No artificial heat is used, and Mr. Smith says he experiences no trouble in the management; no exciting stimulants are used. The vines are planted inside, but never watered there, the roots being encouraged to occupy the outside border only. Pruning at the proper time is carefully attended to, as well as pinching the laterals and thinning the fruit in season. Powdered sulphur is scattered freely about the walls and leaves, and mildew, thrip, or red spider is scarcely seen. Ventilation is given by top sliding sashes only; in the warm months the ventilators are open day and night, but in cool damp weather they are closed.

Vegetables are successfully grown in abundance for table use. Mr. Smith's success with Lima Beans for many years is well-known to us all. Like some of our market gardeners, he has abandoned the French system of growing Celery, and plants it on the level as he would any other crop, and gives as a reason that it is more easily cultivated, and when earthed up the water cannot stagnate about the roots and rot the leaves.

While our report shows that much attention has been given to the useful department, the ornamental has not been neglected. We find a collection of a hundred varieties of Hybrid Perpetual Roses, and a good selection of hardy flowering shrubs, among them fine specimens of the very desirable *Hydrangea paniculata grandiflora*, also Lilies, Pæonies, Phloxes, Delphiniums, Iris, etc., with very fine beds of Rhododendrons, Andromedas, and Azaleas,—finely grown plants, which are mulched in autumn with leaves, that remain undisturbed the succeeding summer. Mr. Smith believes fully in the cultivation of hardy plants and shrubs for permanent decorative purposes, and speaks with much pleasure of the great satisfaction he has derived from introducing them into his grounds.

A small octagonal conservatory, attached to the house, is filled each winter with about three hundred plants, access being had by glass doors directly from the library, making that room a cheerful and pleasant place to spend the cold days of winter. We have noticed in successful cultivation there, Carnations, Heliotropes, Amaryllis, Cyclamens, and the usual other varieties of winter flowering plants.

Undoubtedly some will ask how all that we have described is done; we answer, with the help of one man, a common laborer, who does the heavier work, Mr. Smith doing the rest himself, his aim being to make a pleasant home, and to cultivate every variety of fruit worth growing for a private family.

The Committee express great satisfaction at their visit, and only regret that the invitations to such places are not more frequent. They award Mr. Smith a gratuity of \$20.

The attention of the members of the Society is called to the change in the arrangements of the Prizes of the Garden Committee for the year 1884, and it is earnestly desired that there may be a lively competition for all the premiums. We ask all the members to aid the Committee as much as possible, by calling their attention to any place or places, a knowledge of which would be of interest or profit to the Society.

JOHN G. BARKER,
WM. H. SPOONER,
E. W. WOOD,
C. N. BRACKETT,
HENRY ROSS,
C. W. ROSS,

} Committee
} on Gardens.

REPORT
OF THE
COMMITTEE OF ARRANGEMENTS,
FOR THE YEAR 1883.

The Committee of Arrangements respectfully submit the following report :

Although the season, on account of dry weather, has been somewhat unfavorable to the cultivator, yet the display of fruits, vegetables, plants, and flowers at the several exhibitions has been very fine, and much better than could have been expected.

The Azalea and Rose Show in March was one of the finest ever held by the Society, and was greatly admired by the numerous visitors, as was also the Exhibition of Roses, Strawberries, and Early Vegetables, in June.

The Annual Exhibition, on the 18th, 19th, 20th, and 21st of September was a most successful one, and the fine display of Fruits, Plants, Flowers, and Vegetables was unsurpassed in quality and beauty, and greatly admired by the many who had the good fortune to visit the halls, and was highly satisfactory to the members of the Society.

The Chrysanthemum Show in November, was a decided success, and the beautiful collections exhibited by various growers have never been surpassed. The receipts were highly satisfactory, being more than double those of any other display of the kind.

The exhibitions throughout the year have been carefully looked after and arranged by the Committee, and have proved interesting and attractive to thousands, and we may in truth say that the interest felt in the growth and prosperity of the Massachusetts Horticultural Society is as great, if not greater than ever before.

From the date of the formation of the Society in 1829, a lively interest has been taken in its welfare, and from a small beginning it has become one of the most flourishing institutions in the city.

The details of the various exhibitions have been so fully and faithfully given in the interesting reports of the Committees on Fruits, Flowers, and Vegetables, that it is unnecessary for us to enlarge upon them, as it would, of necessity, be only a repetition ; and, as the receipts and expenses are all given in the Treasurer's Report, the members can ascertain from that the pecuniary results of the exhibitions.

C. H. B. BRECK, *Chairman.*

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION,

FOR THE YEAR 1883.

Your Committee report that the lectures and discussions the past season have been maintained with increased interest; they have been listened to by larger audiences than ever before, and were the most successful series ever held by the Society. We believe they are an important factor in the work in which we are engaged, and that it is the duty of our members to sustain them by contributions of information to the extent of their power.

As the discussions of the current year have already been widely distributed, in the form of extra copies of the reports made by the Secretary for the "Evening Transcript," and have also been published under his careful editorial supervision in our TRANSACTIONS, your Committee deem it unnecessary to make an extended report.

The following prizes have been awarded:

- For an Essay upon the best method of constructing and heating a Greenhouse for amateur use, taking economy and efficiency into account, to William D. Philbrick, of Newton Centre, a prize of . . . \$25 00
- For an Essay upon the question—Are live hedges to be recommended, either for utility or ornament; and if they are, what plants are most suitable?—to John J. Thomas, Union Springs, N. Y., a prize of . . . 25 00

BENJ. G. SMITH, } Committee on
JOHN B. MOORE, } Publication and
WM. H. HUNT, } Discussion.

REPORT
OF THE
COMMITTEE ON THE LIBRARY,
FOR THE YEAR 1883.

There has been but little in the affairs of the Library during the year which calls for special comment. Its growth has been about the same as for many years past.

The income of the Stickney Fund has been expended in the prescribed manner, the Society's appropriation sufficing to keep up our subscription to the periodicals.

An increase in the amount granted a year ago, has enabled the Committee to have a great deal of binding done, thereby making fit for circulation much that in an unbound state was necessarily withheld.

Some of this year's acquisitions, of sufficient importance to deserve notice by title, are Giacomo Zanoni's *Istoria Botanica*, Bologna, 1675; Karsten's *Flora Columbiae*, a splendid work, in two large folio volumes, containing colored plates and descriptions of two hundred South American plants, and Jaubert and Spach's *Illustrations of Oriental plants*, in five volumes, quarto, with five hundred plates.

The successive parts of the *Herefordshire Pomona* and the *Orchid Album* have been received as they were issued, and cannot fail to be of great interest to our members. The principal nurserymen, seedsmen, and florists, of America and Europe, have furnished their catalogues, as in previous years.

The sum of one hundred dollars has been spent upon the *Card Catalogue*. About nine thousand cards have been written this year, against thirteen thousand in 1882, a considerable portion of the time having been spent in placing the cards in alphabetical order in the drawers, a labor demanding the greatest possible

care, for any mistake in arrangement can only be detected by accident. This work has proceeded as far as the letter G, and it is intended to arrange all the cards now ready before writing any more, but by the end of the coming year we believe that at least thirty thousand cards will be in place.

The present year is noteworthy in the annals of botanical literature. That magnificent work, the *Flora Danica*, begun by the Danish Government one hundred and twenty-two years ago, has reached its conclusion. In 1761, the first fasciculus appeared, its title-page declaring that the work was to contain figures of the plants growing spontaneously in the kingdoms of Denmark and Norway, in the duchies of Sleswick and Holstein, and in the seignories of Oldenburg and Delmenhorst; and though all these dependencies have dropped away in the long march of time, leaving, of all those named, only Denmark under the Danish crown, this noble undertaking has progressed from year to year until now, at the end of four generations since its beginning, it stands complete, unsurpassed by any work of its kind.

This year finishes the first half of the term for which the Stickney fund is available for the use of our Library. The importance of this gift to us can hardly be overrated, for it has paid for the greater part of our most important books. It is this fund which has made it possible for us to gather in this room where we now sit, the finest collection of horticultural books in the world. By the thoughtfulness and kindness of Mr. Stickney, we have been enabled to purchase the elegant and sumptuous works with which our shelves are loaded; the ancient and curious books of gardener's craft, by which we can trace the development of this pure and delightful occupation from its earliest stages; the records of the labors of those who have made the affinities of plants the study of their lives; the accounts of the experiments, observations, and conclusions of the man who, by his "*Origin of Species*," not only changed the whole course of biological study, but also suggested new methods in all branches of inquiry, and the publications, equally valuable in another direction, of practical cultivators.

So great, however, has been, and is, the activity of these classes of workers, not only in observing and testing, but in publishing, that this fund will find full employment during the rest of the century.

This Committee has, on former occasions, urged the necessity of having all the books in this room, not only for the convenience of readers, but for safety, and an incident which has recently occurred gives force to these representations. Some of the persons to whom our halls were let on the evening of November 28th, broke open the bookcase at the head of the northern stairway leading to the upper hall. This case contains many sets of agricultural and horticultural reports which have been obtained by great effort on the part of the Librarian, and which would be very difficult to complete again, if broken. None of the books appear to have been abstracted this time, yet the occurrence shows that they are not safe in their present position.

In conclusion, this Committee must again make its annual statement that the bookcases are crowded. Behind the books exposed to view, hundreds of others are packed, unseen and therefore unnoted.

For the Committee,

W. E. ENDICOTT, *Chairman.*

LIBRARY ACCESSIONS.

BOOKS PURCHASED.

- Pierre, L., Directeur du Jardin Botanique de Saïgon. Flore Forestière de la Cochinchine. 5e Fascicule, in continuation. Folio. 16 plates. Paris.
- Jaubert, M. le Comte, et M. Ed. Spach. Illustrationes Plantarum Orientalium, ou Choix de Plantes Nouvelles ou Peu Connues de l'Asie Occidentale. 5 vols. 4to. 500 plates and 4 maps. Paris: 1842-1857.
- Cesati, V., and others. Flora Italiana. Fasc. 29-31, in continuation. 8vo. 7 plates. 1883.
- Willkomm, Maurice. Illustrationes Florae Hispaniae, insularumque Balearium. Livraisons 4, 5, and 6, in continuation. 4to. 28 plates. Stuttgart: 1882.
- Flora Danica. Fasc. 51, completing the work. Folio. 60 colored plates. Hauniæ: 1883.
- Hallier, Dr. Ernst. Flora von Deutschland. Lieferungen 57-95, in continuation. Small 8vo. Many colored plates. Gera-Untermhaus: 1882-1883.

- Schkuhr, Christian. *Botanisches Handbuch der mehresten theils in Deutschland wildwachsenden, theils ausländischen in Deutschland unter freiem Himmel ausdauernden Gewächse. Zweite mit dem Nachtrag der Riedgräser vermehrte Auflage.* 4 vols. in 6. 8vo. 485 colored plates. Leipsic: 1808.
- Seboth, Jos., and F. Graf. *Alpenpflanzen.* Nos. 42-46, in continuation. 16mo. 45 colored plates. Prague: 1882-83. Also, the English Text to the first three series. Edited by Alfred W. Bennett. London.
- Jenkinson, James. *A Generic and Specific Description of British Plants; translated from the Genera et Species Plantarum of the celebrated Linnæus, etc.* 8vo. 5 plates. Kendal: 1775.
- Meyer, Ernestus. *De Plantis Labradoricis.* 16mo. Leipsic: 1830.
- Provancher, L'Abbé L., Curé de Portneuf. *Flore Canadienne, ou Descriptions de toutes les Plantes des Forêts, Champs, Jardins, et Eaux du Canada, accompagnée d'un Vocabulaire des Termes Techniques, et de Clefs Analytiques.* 8vo. 2 vols. in 1. 420 wood-cuts. Quebec: 1862.
- Rafinesque, C. S., A.M., M.D. *Medical Flora, or Manual of the Botany of the United States of North America, containing Figures and Descriptions of Medical Plants.* 2 vols. 12mo. Wood-cuts. Philadelphia: 1828-1830.
- Bongard, M. *Observations sur la Végétation de l'Isle de Sitchka.* 4to. pamphlet. 1831.
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- United States Department of Agriculture. Report upon Cotton Insects, prepared under the direction of the Commissioner of Agriculture, by J. Henry Comstock, Entomologist to the Department. 8vo. 3 plates, 77 wood-cuts. Washington: 1879. The Commissioner of Agriculture.

Division of Entomology. Bulletin No. 1.

Report of Experiments, chiefly with Kerosene, upon the Insects injuriously affecting the Orange Tree and the Cotton Plant, made under the direction of the Entomologist.

- United States Department of Agriculture. Division of Entomology. Bulletin No. 2. Reports of Observations on the Rocky Mountain Locust and the Chinch Bug. Together with Extracts from the Correspondence of the Division, on Miscellaneous Insects.
- Bulletin No. 3. Reports of Observations and Experiments in the Practical Work of the Division, made under the direction of the Entomologist, Charles V. Riley. 3 pamphlets. 8vo. Washington: 1883. Charles V. Riley.
- United States Entomological Commission. Bulletin No. 3. The Cotton Worm, etc. By Charles V. Riley. 8vo. pamphlet. 84 wood-cuts. Washington: 1880.
- Bulletin No. 6. General Index, and Supplement to the Nine Reports on the Insects of Missouri, by Charles V. Riley, M. A., Ph. D. 8vo. pamphlet. Washington: 1881. The Secretary of the Interior, by request of the Author.
- Scudder, Samuel H. The Pine Moth of Nantucket, *Retinia Frustrana*. 8vo. pamphlet. 1 colored plate. Boston: 1883. [Published by the Massachusetts Society for the Promotion of Agriculture.] 2 copies. The Author.
- Maine State College of Agriculture, and the Mechanic Arts. Annual Reports of the Trustees and Officers for 1870, 1872-1877, 1881, and 1882. 9 pamphlets. 8vo. Augusta: 1871-1882. Merritt C. Fernald, President.
- Kansas State Agricultural College. Catalogue, 1882-1883. 8vo. pamphlet. Manhattan: 1883.
- Massachusetts Institute of Technology. Eighteenth Annual Catalogue of the Officers and Students, with a Statement of the Course of Instruction, etc. 1882-1883. Boston: 1882.
- Illinois Industrial University. Tenth and Eleventh Annual Reports of the Board of Trustees, 1879-1882. 2 vols. 8vo. Springfield: 1881, 1882. Also, Biennial Report to the State Superintendent of Public Institutions, by the Regent, November 17, 1882, and Catalogue and Circular, 1882-1883. 2 pamphlets. 8vo. Champaign: 1882, 1883. James D. Crawford, Librarian.
- Illinois State Laboratory of Natural History. Bulletin No. 3, November, 1880, and No. 6, May, 1883. 2 pamphlets. 8vo. S. A. Forbes, Director. [Contains papers by Professor Forbes, on the Food of Birds, and on the Regulative Action of Birds upon Insect Oscillations.]
- Smithsonian Institution. Annual Report of the Board of Regents, showing the Operations, Expenditures, and Condition of the Institution for the year 1881. 8vo. Wood-cuts. Washington: 1883.
- Essex Institute. Bulletin, Vol. 13, 1881; Vol. 14, Nos 1-6. 8vo. Salem: 1881-1883. The Institute.
- Boston Society of Natural History. Proceedings, Vol. 21, Parts 2 and 3, December, 1880, January, 1882. 2 pamphlets. 8vo. Plates. Boston: 1882. Memoirs, Vol. 3, No. 5. 4to. pamphlet. 3 plates. Boston: 1882. The Society.

- Indiana Department of Geology and Natural History. Twelfth Annual Report, by John Collett, State Geologist, 1882. 8vo. 38 plates. Indianapolis: 1883. D. E. Hoffman.
- La Nature. January, 1883. 8vo. pamphlet. Paris. Ch. Joly.
- Annual Report of the Chief Signal Officer to the Secretary of War, for the years 1872, 1879, 1880, and 1881. 4 vols. 8vo. Many charts, etc. Washington: 1873, 1880, and 1881. Also, duplicate copies. Brigadier and Brevet Major General W. B. Hazen, Chief Signal Officer of the Army.
- Signal Service Notes, No. 1. Report on the Michigan Forest Fires of 1881, by Sergeant William O. Bailey. No. 2, on the Use of Homing Pigeons for Military Purposes, by 1st Lieut. William E. Berkheimer. 2 pamphlets. 8vo. Washington: 1882. No. 4, The Use of the Spectroscope in Meteorological Observations. By Winslow Upton, A.M. Prepared under the direction of the Chief Signal Officer of the Army. 8vo. pamphlet. 3 charts. Washington: 1883. The Chief Signal Officer.
- Signal Service Professional Papers, No. 2. Isothermal Lines of the United States, 1871-1882. By Lieut. A. W. Greely. 4to. pamphlet. 12 charts. Washington: 1881. The Chief Signal Officer.
- Lynn Public Library. Twentieth Annual Report of the Trustees, for the year 1882. 8vo. pamphlet. Lynn: 1883. Edward S. Davis, President of the Trustees.
- Astor Library. Thirty-fourth Annual Report of the Trustees, for the year 1882. 8vo. pamphlet. New York: 1883. F. Saunders, Librarian.
- Mercantile Library Association of the City of New York. Sixty-second Annual Report of the Board of Direction, May, 1882-April, 1883. 8vo. pamphlet. New York: 1883.
- Library Company of Philadelphia. Bulletin. New Series, Nos. 11 and 12, July, 1883, and January, 1884. 2 pamphlets. 8vo. Lloyd P. Smith, Librarian.
- Quaritch, Bernard. General Catalogue of Books, Parts 2 and 3. 2 vols. 8vo. London: November, 1881, and May, 1882. The Publisher.
- Friedländer, R. & Sohn. Bibliotheca Historico-Naturalis et Mathematica. 8vo. Berlin: 1883. The Publishers.
- United States Bureau of Education. Report of the Commissioner for the year 1881. 8vo. Washington: 1883. Circulars of Information, Nos. 3-6, 1882; Nos. 1-3, 1883. 7 pamphlets, 8vo. Washington: 1882, 1883. Also 8 other pamphlets and broadsides relating to Education. Hon. John Eaton, Commissioner.
- American Antiquarian Society. Proceedings at the Annual Meeting held at Worcester, October 21, 1882, and at the Semi-Annual Meeting, April 25, 1883. Also List of Publications, compiled by Nathaniel Paine. 3 pamphlets. 8vo. Worcester: 1883.
- New England Historic Genealogical Society. Proceedings at the Annual Meeting, January 3, 1883. 8vo. pamphlet. Boston: 1883.

- Minnesota Historical Society. Biennial Report to the Legislature of Minnesota, Session of 1883. 8vo. pamphlet. Minneapolis: 1883.
- Bowdoin College. Eighty-first and Eighty-second Annual Catalogues, for the Academic years 1882-1883 and 1883-1884. 2 pamphlets. 8vo. Brunswick: 1882, 1883. The Librarian.
- Boston; What to See, and How to See it. 32mo. Boston: 1883. Moses King, publisher.
- Central and Western Nebraska, and the Experience of its Stock Growers. Nebraska and its Settlers; What they have done, and how they do it; its Crops and its People. Creameries and Dairying in Nebraska. Corn is King, and How it Rules in Nebraska. 4 pamphlets. 8vo. Compiled by J. T. Allan. Omaha: 1882, 1883. The Compiler.
- Texas; Resources, Soil, and Climate of. Report of A. W. Spaight, Commissioner of Statistics. 8vo. Map. Galveston: 1882. E. A. Sawtelle.
- Report of the Secretary of the Interior for the Fiscal Year ending June 30, 1882. 8vo. pamphlet. Washington: 1882.
- In Memoriam. Henry Brooks Ellwanger. Small 4to. pamphlet. Rochester: 1883. George Ellwanger.
- In Memoriam. Dr. John A. Warder. 8vo. pamphlet. [From the American Journal of Forestry, August, 1883.] Hon. Marshall P. Wilder. 6 copies.


PERIODICALS PURCHASED.

- ENGLISH. — Gardeners' Chronicle.
 Gardeners' Magazine.
 Journal of Horticulture and Cottage Gardener.
 The Garden.
 Gardening Illustrated.
 Curtis's Botanical Magazine.
 Florist and Pomologist.
 Journal of Botany.
 Journal of Forestry.
- FRENCH. — Revue Horticole.
 Revue des Eaux et Forêts.
- BELGIAN. — Illustration Horticole.
 Flore des Serres.
 Belgique Horticole.
 Revue de l' Horticulture, Belge et Étrangère.
- GERMAN. — Botanische Zeitung.
 Gartenflora.
- AMERICAN. — Country Gentleman.
 American Journal of Forestry.
 American Naturalist.

PERIODICALS RECEIVED IN EXCHANGE.

Gardener's Monthly.
 Canadian Horticulturist.
 Ladies' Floral Cabinet.
 Rural Californian.
 American Garden.
 Vick's Illustrated Monthly Magazine.
 Green's Fruit Grower.
 Bowditch's Magazine.
 Seed Time and Harvest.
 Bulletin of the Torrey Botanical Club.
 Botanical Gazette.
 The Scientific Roll.
 Maine Farmer.
 The Home Farm.
 Mirror and Farmer.
 New England Farmer.
 Massachusetts Ploughman.
 American Cultivator.
 New England Homestead.
 American Agriculturist.
 Rural New Yorker.
 The Husbandman.
 American Rural Home.
 Maryland Farmer.
 Florida Dispatch.
 Prairie Farmer.
 The Industrialist.
 Boston Daily Advertiser.
 Boston Morning Journal.
 Boston Post.
 Boston Daily Globe.
 Boston Evening Transcript.
 Daily Evening Traveller.
 The Cottage Hearth.

BOOKS, ETC., WANTED.

 Persons having any of the books in the following list to dispose of will oblige by addressing the "Librarian of the Massachusetts Horticultural Society, Horticultural Hall, Boston."

Bolton's Filices Britannicæ, Part.2. 4to. Huddersfield, 1790.
 Sowerby's English Botany, Supplement to the 1st edition; Vol. 5, including all the plates beyond No. 2,960.
 Curtis's Beauties of the Rose. Vol. 2. 4to.
 Parnell's Grasses of England. 8vo. Edinburgh: 1845.

- Murray, Andrew, on the Synonymy of various Conifers, — all but Part 1.
 ———. Notes upon Californian Trees, all but Part. 1.
- Bateman's First Century of Orchidaceous Plants.
- Lindley's Folia Orchidacea, Part 9.
- Floral World, 1866.
- Royal (London), Horticultural Society's Journal, between Vol. 9, 1854, and Vol. 6 [New Series?], 1880.
- Annales de la Société d'Horticulture de Paris, January, 1832.
- Bulletin de la Société d'Horticulture du Département de la Seine Inférieure (formerly Société de Rouen), Tome 5, Cahier 4; Tome 7, Cahier 1; Tome 14, Cahier 2. Also, Tome 2, Cahier 8; Tome 3, Cahiers 2 and 6; being Cahiers 1, 2, and 3 of Tome 1 of Pomologie (pp. 1-52, 53-76, and 77-108). Also, Tome 1, Cahier 6, Pomologie (pp. 159-175); Tome 2, Cahier 3, Pomologie.
- Bulletin de la Société d'Horticulture de la Sarthe. All previous to 1872.
- Indiana Horticultural Society. Transactions at the first nine sessions, previous to 1871.
- Missouri Horticultural Society. Reports previous to 1880, except that of the 5th meeting, in 1864.
- Iowa State Horticultural Society. Reports previous to 1867; also 1868, 1869, 1871 and 1874.
- Nebraska Horticultural Society. Transactions, other than 1871, 1872, 1877-1878, and 1879.
- Ontario Fruit Growers' Association. Reports previous to 1869.
- Pennsylvania Fruit Growers' Society. Reports previous to 1867.
- Ohio Nurserymen and Fruit Growers' Convention Reports. Ohio Pomological Society's Reports, except the Fourth and Eighth Sessions, 1852 and 1857.
- United States Patent Office Agricultural Reports, 1839, 1842, 1843.
- United States Department of Agriculture; Special Reports, 14 and 15, First Series.
- Reports of the Consuls of the United States on the Commerce, Manufactures, etc., of their Consular Districts. Nos. 1, 2, 4, 5, 8-10, 14, 16, 18-20, 23, 27-29.
- Virginia Commissioner of Agriculture, First Annual Report.
- Illinois Entomological Reports; First, by B. D. Walsh.
- Iowa Forestry Annual, — all but No. 5, 1879.
- Boston Park Reports. City Documents, No. 123, 1869; No. 15, 1879; Nos. 84, 111, 118, 1880; Nos. 23, 93, 124, and 134, 1881; No. 148, 1882, and No. 150, 1883.
- Central Park, New York. Second Report, 1859, with map.
- Brooklyn Park Reports. 12th, 1871, 13th, 1872, and all subsequent to 1882.
- Fairmount Park. Fourth Annual Report of the Commissioners, with illustrations.
- The Phytologist. First series, 1842-1855.
- Revue Horticole. First Series, Vols. 1-3, Paris: 1829-1840; Second Series, Vols. 1-5, 1841-1846.

- The Flower Garden. Published by Beach & Son, Brooklyn. Sept. 1872–June 1874, 8 numbers. American Garden: The four numbers for 1876, July and October, 1877, and January, 1878, and the four numbers for 1879.
- California Horticulturist. Vols. 7 and 8, and the January, February, March, April, and July numbers of Vol. 9.
- Semi-Tropic California, January, 1881, and March, 1882.
- The Semi-Tropical (Jacksonville, Fla.). Vol. 1, 1875, the March number of Vol. 3., and the March number of Vol. 4.
- Journal of the New York State Agricultural Society. Vol. 11, Nos. 1, 4, 7, and 9. Vol. 12, No. 12. Vol. 13, Nos. 10, 11, and 12. Vol. 14, Nos. 3, 5, 7, 9, 10, 11, and 12. Vol. 15, Nos. 3, 4, 6, 7, and 12. Vol. 16, No. 2, and the whole of Vols. 17, 18, and 19.
- American Agricultural Association Review and Journal, January, 1882, and February and March, 1883.
- New England Farmer. 8vo. 1864. Part of Vol. 16.
- American Agriculturist. Vol. 1, No. 2; Vol. 2, No. 1; and Vols. 9, 11, 15, 22, and 23.
- Country Gentleman. Vol. 2, Nos. 27, 28, 29, and 30. Also, Title page and Index.
- American Farmer. Fifth Series. Vol. 3, Nos. 7–12, January–June, 1862, and the succeeding volumes to 1873, inclusive, also the numbers for October and December, 1877, and April to December, inclusive, 1878.
- Maryland Farmer, March, 1875.
- Anales de la Sociedad Rural Argentina. Vol. 16, Nos. 3, and 20.
- American Agricultural Annual, Nos. 1, 2, and 3, 1867, 1868, and 1869.
- American Horticultural Annual, Nos. 1, 4, and 5, 1867, 1870, and 1871.
- Prairie Farmer Annual, Nos. 3 and 4, 1869 and 1870.
- Massachusetts Agricultural College, 1st, 2d, 3d, 17th, 18th, 19th, and 21st, Annual Reports.
- Ontario School of Agriculture, 1st, 2d, and 3d Reports, 1875, 1876, and 1877.

REPORT
OF THE
SECRETARY AND LIBRARIAN,
FOR THE YEAR 1883.

Besides the gradual increase of work in all departments, the most noteworthy variation from the former work of the Secretary has been the printing of extra copies of the reports in the "Evening Transcript," of the meetings for discussion. The report of each Saturday's meeting has thus been placed on our tables the following week, and has proved highly acceptable to members of the Society and others. Under these circumstances special pains have been taken to make the reports as accurate and complete as the time admissible for preparing a report for a daily paper, and the space allowed, would permit.

In the library, drawers for the accommodation of the Card Catalogue have been added to all the bookcases in the smaller room, and in doing this the bookcases, which were much settled by the weight of the books, have been, in effect, rebuilt, and are now more substantial than ever before. In replacing the books they have been better classified, and the improvement of the classification, as well as the completion of imperfect volumes and sets throughout the library, has been diligently pursued. The increase of the appropriation for binding, etc., has permitted the thorough repair, which was much needed, of the ancient books mentioned in the report of the Library Committee for 1882, as purchased during that year, and also the reduction, to some extent, of the accumulation of books needing binding. This work also will be continued during the coming year, and it is believed that the present appropriation will, if continued for a few years, enable us to entirely clear off this accumulation.

ROBERT MANNING,
Secretary and Librarian.

TREASURER'S REPORT,

FOR THE YEAR 1883.

RECEIPTS.

| | |
|--|-------------|
| Cash on hand as per last report, | \$8,332 38 |
| Rent of Halls, | 7,439 72 |
| “ “ Stores, | 10,119 00 |
| Admissions and Assessments, | - 890 00 |
| Library, Sale of Books, | 30 00 |
| Sale of History, | 10 50 |
| Sale of Transactions, | 4 00 |
| Mount Auburn Cemetery, | 4,399 68 |
| Annual Exhibitions, | 950 61 |
| Special Rose Prizes, | 10 00 |
| Sundries, | 94 12 |
| | <hr/> |
| | \$32,280 01 |

EXPENDITURES.

| | |
|--|-------------|
| Labor, | \$1,073 02 |
| Salaries, | 2,275 00 |
| Incidentals, | 156 75 |
| Interest, | 3,454 16 |
| Taxes, | 3,522 32 |
| Repairs on Building, | 262 53 |
| Heating (\$415.95) and water (\$14.38), less paid by tenants, | 430 33 |
| Lighting, | 955 07 |
| Furniture and Fixtures, | 513 20 |
| Prizes, | 2,770 65 |
| Committee of Arrangements, | 429 85 |
| Committee on Publication and Discussion, | 25 00 |
| Stationery, Postage, and Printing, | 997 19 |
| Stickney Fund, | 710 95 |
| | <hr/> |
| <i>Carried forward,</i> | \$17,576 02 |

| | | |
|--|-------------|-------------|
| <i>Brought forward,</i> | \$17,576 02 | |
| Library, | 330 00 | |
| Card Catalogue, | 100 00 | |
| Reduction of Floating Debt, | 9,000 00 | |
| Rights on Montgomery Place, | 50 50 | |
| Damages from Accident, and Legal Services, | 1,080 98 | |
| Cash on hand December 31, 1883, | 4,142 51 | |
| | <hr/> | \$32,280 01 |

ASSETS.

| | | |
|--|--------------|--------------|
| Real Estate, Furniture, and Exhibition ware, | \$256,585 56 | |
| Library last year, | \$21,646 12 | |
| Added this year, | 1,000 00 | |
| | <hr/> | 22,646 12 |
| Bonds, C., B. & Q. R. R., at par, | 1,500 00 | |
| Stereotype Plates, and copies of History, | 394 00 | |
| Cash on hand December 31, 1883, | 4,142 51 | |
| | <hr/> | \$285,268 19 |

LIABILITIES.

| | | |
|---|-------------|--------------|
| Mortgage debt, bearing interest at $4\frac{1}{4}$ per cent. per annum, due October 1, 1888, | \$60,000 00 | |
| Loan, without interest, payable to Harvard College in 1899, | 12,000 00 | |
| Note payable to Massachusetts National Bank, | 3,000 00 | |
| | <hr/> | 75,000 00 |
| Surplus, | | \$210,268 19 |

MEMBERS.

| | | |
|---|-------|-----|
| Number of Life Members per last report, | 583 | |
| Added during the year, | 13 | |
| | <hr/> | 596 |
| Deceased, | 8 | |
| | <hr/> | 588 |

TREASURER'S REPORT.

317

| | | |
|---|----------|----------|
| Annual Members per last report, | 274 | |
| Added during the year, | 17 | |
| | <hr/> | |
| | 291 | |
| Deceased, | 5 | |
| Discontinued, | 2 | |
| | <hr/> | |
| | 7 | |
| | <hr/> | |
| | 284 | |
| Total number of members, | | 872 |
| Income from membership: | | |
| 13 Life Members, | \$390 00 | |
| 17 Annual Members, | 170 00 | |
| 165 Assessments, | 330 00 | |
| | <hr/> | |
| | | \$890 00 |

The Finance Committee having audited the accounts of the undersigned, made and have subscribed to, on a book kept for that purpose, the following report:

The Massachusetts Horticultural Society
 In account with GEORGE W. FOWLE, *Treasurer.*

Credit.

| | |
|--|-------------|
| By balance in treasury, December 31, 1882, | \$8,332 38 |
| “ Total income as per receipt book, | 23,947 63 |
| | <hr/> |
| | \$32,280 01 |
| | <hr/> <hr/> |

Contra Debit.

| | |
|--|-------------|
| To cash paid out as per disbursement book, | \$28,137 50 |
| “ Balance to new account, | 4,142 51 |
| | <hr/> |
| | \$32,280 01 |
| | <hr/> <hr/> |

BOSTON, February 1, 1884. We have examined the above account, and find it correct, and the balance of cash on hand forty-one hundred and forty-two dollars and fifty-one cents, as stated.

(Signed) H. H. HUNNEWELL, } *Finance*
 FRANCIS B. HAYES, } *Committee.*
 FRED'K L. AMES, }

For the year 1883 the average income of the Society, from rental of Halls, Stores, and Mount Auburn Cemetery has been about the same as in 1882. The floating debt of \$12,000 has been reduced to \$3,000 during the past year, and this balance of \$3,000 will be paid in January, 1884, from funds now on hand.

The mortgage debt of \$60,000, at $5\frac{1}{2}$ per cent. interest, has been renewed for five years, coming due October 1, 1888, and the annual rate of interest has been reduced to $4\frac{1}{4}$ per cent.

The rental of Stores for 1884 is expected to show an increase of about twenty-five hundred dollars.

GEO. W. FOWLE, *Treasurer.*

Boston, February 7, 1884.

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* **C**r.

For Sales and Improvements within the Cemetery for the year ending December 31st, 1883.

| | | | |
|--|-------------------|--|--------------------|
| Cost of filling up and improving land at Mt. Auburn, for the year ending December 31, 1883; the Massachusetts Horticultural Society being charged with their proportion of the same: | | | |
| Ivy Path, | \$487 00 | | |
| Chant and Warriss Lots, | 1,875 63 | | |
| Pearl Avenue to Eagle Avenue, | 934 87 | | |
| | <u>\$3,297 50</u> | | |
| One-quarter of \$3,297.50 is | \$824 38 | | |
| Balance due Massachusetts Horticultural Society, | 4,399 68 | | |
| | <u>\$5,224 06</u> | | |
| | | By Sales in January, | \$451 00 |
| | | “ “ February, | 263 00 |
| | | “ “ March, | 440 00 |
| | | “ “ April, | 537 50 |
| | | “ “ May, | 3,499 75 |
| | | “ “ June, | 4,942 50 |
| | | “ “ July, | 2,996 00 |
| | | “ “ August, | 1,338 75 |
| | | “ “ September, | 1,089 75 |
| | | “ “ October, | 3,569 00 |
| | | “ “ November, | 1,321 00 |
| | | “ “ December, | 1,242 00 |
| | | Net amount receipts from Receiving Tomb, | 643 00 |
| | | | <u>\$22,333 25</u> |
| | | Less graves repurchased, | 37 00 |
| | | | <u>\$22,296 25</u> |
| | | Deduct for Annual Expenses, | 1,400 00 |
| | | Mass. Horticultural Society one-fourth part of | \$20,896 25 |
| | | | <u>\$5,224 06</u> |

December 31, 1883. E. & O. E.

H. B. MACKINTOSH, Treasurer.

MASSACHUSETTS HORTICULTURAL SOCIETY,

To the PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN, Dr.

For one-fourth part of the following expenditures for grading new lands for sale during 1883:

Ivy Path.

| | | | | | | | | | | |
|-----|------------|----------------|---|---|---|---|---|-------|----|-----------------|
| 240 | days, men, | . | . | . | . | . | . | \$480 | 00 | |
| 2 | " | man and horse, | . | . | . | . | . | 7 | 00 | |
| | | | | | | | | | | <u>\$487 00</u> |

Chant and Watriss Lot.

| | | | | | | | | | | |
|------|------------|----------------|---|---|---|---|---|-------|----|-----------------|
| 138½ | days, men, | . | . | . | . | . | . | \$277 | 00 | |
| 456¾ | " | man and horse, | . | . | . | . | . | 1,598 | 63 | |
| | | | | | | | | | | <u>1,875 63</u> |

Pearl Avenue to Eagle Avenue.

| | | | | | | | | | | |
|------|------------|----------------|---|---|---|---|---|-------|----|---------------|
| 145 | days, men, | . | . | . | . | . | . | \$290 | 00 | |
| 184¼ | " | man and horse, | . | . | . | . | . | 644 | 87 | |
| | | | | | | | | | | <u>934 87</u> |

\$3,297 50

| | | | | | | | | | | |
|----------------------------------|---|---|---|--|--|--|--|--|--|-----------------|
| One-fourth part of \$3,297.50 is | . | . | . | | | | | | | <u>\$824 38</u> |
|----------------------------------|---|---|---|--|--|--|--|--|--|-----------------|

J. W. LOVERING, *Sup't.*

MOUNT AUBURN, Dec. 31, 1883.

I certify the foregoing to be a true copy of accounts of improvements for the year 1883, rendered by the Superintendent.

H. B. MACKINTOSH, *Treasurer.*

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1884.

President.

FRANCIS B. HAYES, of Boston.

Vice-Presidents.

JOHN B. MOORE, of Concord.
JOHN CUMMINGS, of Woburn.

BENJAMIN G. SMITH, of Cambridge.
CHARLES H. B. BRECK, of Boston.

Treasurer and Superintendent of the Building.

GEORGE W. FOWLE, of Boston.

Secretary and Librarian.

ROBERT MANNING, of Salem.*

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Standing Committees.

Executive.

THE PRESIDENT, FRANCIS B. HAYES, CHAIRMAN.

THE EX-PRESIDENTS, MARSHALL P. WILDER, CHARLES M. HOVEY, JAMES F. C. HYDE, WILLIAM C. STRONG, FRANCIS PARKMAN, WILLIAM GRAY, JR.; CHAIRMAN OF FINANCE COMMITTEE, H. H. HUNNEWELL; F. L. AMES, CHARLES H. B. BRECK, JOHN C. HOVEY, HENRY P. WALCOTT.

* Communications for the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston.

Finance.

H. HOLLIS HUNNEWELL, CHAIRMAN.

FRANCIS B. HAYES.

F. L. AMES.

Publication and Discussion.

BENJAMIN G. SMITH, CHAIRMAN.

JOHN B. MOORE.

WILLIAM H. HUNT.

Establishing Prizes.

CHAIRMAN OF COMMITTEE ON FRUITS, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON FLOWERS, VEGETABLES, AND GARDENS,
EX OFFICIIS; C. M. ATKINSON, P. BROWN HOVEY, JOHN B. MOORE.

Library.

WILLIAM E. ENDICOTT, CHAIRMAN.

THE PROFESSOR OF BOTANY AND VEGETABLE PHYSIOLOGY
AND THE PROFESSOR OF ENTOMOLOGY, *EX OFFICIIS*;

HENRY P. WALCOTT.

FRANCIS H. APPLETON.

J. D. W. FRENCH.

E. P. RICHARDSON.

Gardens.

JOHN G. BARKER, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, AND VEGETABLES,
EX OFFICIIS;

GEORGE S. HARWOOD, CHARLES W. ROSS, JOHN E. PEABODY.

Fruit.

E. W. WOOD, CHAIRMAN.

P. BROWN HOVEY.

CHARLES F. CURTIS.

O. B. HADWEN.

BENJAMIN G. SMITH.

J. W. MANNING.

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WILLIAM H. SPOONER, CHAIRMAN.

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JAMES CARTWRIGHT.

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EDWARD L. BEARD.

Vegetables.

CHARLES N. BRACKETT, CHAIRMAN.

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GEORGE W. PIERCE.

WARREN HEUSTIS.

CHARLES E. GRANT.

SAMUEL HARTWELL.

CEPHAS H. BRACKETT.

Committee of Arrangements.

EDWARD L. BEARD, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, VEGETABLES, AND
GARDENS, *EX OFFICIIS*;

JOHN C. HOVEY.

WILLIAM H. HALLIDAY.

C. M. ATKINSON.

JAMES COMLEY.

CHARLES F. CURTIS.

JOSEPH H. WOODFORD.

WARREN HEUSTIS.

NATHANIEL T. KIDDER.

MEMBERS FOR LIFE.

Change of residence, or any inaccuracies, should be promptly reported to the Secretary.

| | | | |
|-----------------------|----------------|-------------------------|-----------------|
| Adams, George E., | Medford. | Bates, Caleb, | Kingston. |
| Albro, Charles, | Taunton. | Bayley, John P., | Boston. |
| Alger, R. F., | Becket. | Beal, Alexander, | Dorchester. |
| Allan, David, | Mount Auburn. | Beckford, D. R., Jr., | Dedham. |
| Ames, Frank M., | Canton. | Bell, Joseph H., | Quincy. |
| Ames, Frederick L., | North Easton. | Bemis, Emery, | Grantville. |
| Ames, George, | Boston, | Berry, James, | Boston. |
| Ames, P. Adams, | “ | Bickford, Weare D., | Allston. |
| Amory, Charles, | “ | Birchard, Charles, | Framingham. |
| Amory, Frederick, | Brookline. | Black, James W., | Boston. |
| Amory, James S. | Boston. | Blagg, Samuel, | Newbern, N. C. |
| Anderson, Alexander, | Hingham. | Blanchard, J. W., | Boston. |
| Andrews, Charles L., | Swampscott. | Blaney, Henry, | Brookline. |
| Andrews, Frank W., | Boston. | Blinn, Richard D., | Chicago, Ill. |
| Andros, Milton, | Brookline. | Bliss, William, | Springfield. |
| Appleton, Edward, | Reading. | Bocher, Ferdinand, | Boston. |
| Appleton, Francis H., | Peabody. | Bockus, Charles E., | Dorchester. |
| Appleton, Wm. S., | Boston. | Bond, George W., | Boston. |
| Atkins, Elisha, | Belmont. | Borland, John N., | New London, Ct. |
| Avery, Edward, | Boston. | Botume, John, | Stoneham. |
| Ayer, Adams, | “ | Bouvé, Thomas T., | Boston. |
| Ayling, Isaac, | “ | Bowditch, Azell C., | Somerville. |
| | | Bowditch, J. Ingersoll, | Boston. |
| Bacon, George, | Brookline. | Bowditch, Wm. E., | “ |
| Bailey, Edwin C., | Concord, N. H. | Bowker, William H., | “ |
| Baker, William E., | Boston. | Brackett, Cephas H., | Brighton. |
| Bancroft, John C., | Milton. | Brackett, Charles N., | Newton. |
| Banfield, Francis L., | Boston. | Bradish, Levi J., | Boston. |
| Barnard, Rev. C. F., | “ | Bragg, Samuel A. B., | Mattapan. |
| Barnard, James M., | “ | Breed, Henry A., | Lynn. |
| Barnard, Robert M., | Everett. | Bresee, Albert, | Hubbardton, Vt. |
| Barnes, Walter S., | Somerville. | Brewer, John Reed, | Boston. |
| Barnes, William H., | Boston. | Brewer, Otis, | “ |
| Barney, Levi C., | “ | Brigham, William T., | “ |
| Barratt, James, | Cambridgeport. | Brimmer, Martin, | “ |
| Barrett, Edwin S., | Concord. | Brintnall, Benjamin, | “ |
| Barrows, Thomas, | Dedham. | Brooks, Francis, | Medford. |
| Bartlett, Edmund, | Newburyport. | Brown, Charles E., | Yarmouth, N. S. |
| Bates, Amos, | Hingham. | Brown, Edward J., | Brookline. |

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|-----------------------|------------------|----------------------|----------------|
| Brown, G. Barnard, | Boston. | Clay, Henry, | Dorchester. |
| Brown, George B., | " | Cleary, Lawrence, | West Roxbury. |
| Brown, Jacob, | Woburn. | Clement, Asa, | Dracut. |
| Brownell, E. S., | Essex Junc., Vt. | Cleveland, Ira, | Dedham. |
| Bruce, Nathaniel F., | Stoneham. | Cobb, Albert A., | Brookline. |
| Bullard, John R., | Dedham. | Coburn, Isaac E., | Everett. |
| Bullard, William S. | Boston. | Codman, James M., | Brookline. |
| Burnett, Joseph, | Southborough. | Codman, Ogden, | Lincoln. |
| Burnham, T. O. H. P., | Boston. | Coffin, G. Winthrop, | West Roxbury. |
| Burr, Fearing, | Hingham. | Coffin, William E., | Boston. |
| Burr, Matthew H., | " | Converse, E. S., | Malden. |
| Buswell, Edwin W., | New York, N.Y. | Converse, Parker L., | Woburn. |
| Buswell, Frank E., | " " " | Coolidge, Joshua, | Watertown. |
| Butler, Aaron, | Wakefield. | Copeland, Franklin, | West Dedham. |
| Butler, Edward K., | Jamaica Plain. | Cox, George P., | Malden. |
| Butterfield, Wm. P., | Arlington. | Coy, Samuel I., | Boston. |
| | | Crocker, George O., | New Bedford. |
| Cadness, John, | Flushing, N. Y. | Crocker, Uriel, | Boston. |
| Cains, William, | South Boston. | Crosby, Josiah, | Arlington. |
| Calder, Augustus P., | Boston. | Crowell, Philander, | Chelsea. |
| Capen, John, | " | Crowell, Randall H., | " |
| Carlton, Samuel A., | Somerville. | Cummings, John, | Woburn. |
| Carruth, Charles, | Boston. | Curtis, Charles F., | Jamaica Plain. |
| Carruth, Nathan, | Dorchester. | Curtis, George S., | " " |
| Carter, Miss Sabra, | Wilmington. | Cushing, Robert M., | Boston. |
| Chamberlain, C. W., | Arlington. | | |
| Chapin, N. G., | Brookline. | Daggett, Henry C., | Boston. |
| Chapman, Edward, | Arlington. | Damon, Samuel G., | Arlington. |
| Chase, A. J., | Lynn. | Dana, Charles B., | Brookline. |
| Chase, Daniel E., | Somerville. | Darling, Charles K., | Boston. |
| Chase, Hezekiah S., | Boston. | Davenport, Edward, | Dorchester. |
| Chase, William M., | Baltimore, Md. | Davenport, Geo. E., | Boston. |
| Cheney, Benjamin P., | Boston. | Davenport, Henry, | " |
| Child, Francis J., | Cambridge. | Davis, Curtis, | Cambridge. |
| Child, William C., | Medford. | Davis, Hervey, | Cambridgeport. |
| Childs, Francis, | Charlestown. | Dawson, Jackson, | Jamaica Plain. |
| Childs, N. R., | Dorchester. | Deblois, Stephen G., | Boston. |
| Clafin, Henry, | Brighton. | Denny, Clarence H., | " |
| Clafin, William, | Newton. | Denny, R. S., | Dorchester. |
| Clapp, Edward B., | Dorchester. | Denton, Eben, | Braintree. |
| Clapp, E. W., | Walpole. | Dewson, Francis A., | Boston. |
| Clapp, James H., | Dorchester. | Dexter, F. Gordon, | " |
| Clapp, William C., | " | Dickerman, Geo. H., | Somerville. |
| Clark, Orus, | Worcester. | Dickinson, Alex., | Cambridgeport. |
| Clark, William S., | Amherst. | Dike, Charles C., | Stoneham. |
| Clark, W. L., | Neponset. | Dinsmore, Wm. B., | New York, N.Y. |
| Clarke, Miss Cora H., | Jamaica Plain. | Dix, Joseph, | Boston. |

| | | | |
|-----------------------|-----------------|-----------------------|-------------------|
| Dorr, George, | Dorchester. | Gardner, John L., | Brookline. |
| Dove, George W. W., | Andover. | Gibbs, Wolecott, | Cambridge. |
| Durant, William, | Boston. | Gillard, William, | Boston. |
| Durfee, Mrs. F. B., | Fall River. | Gilson, F. Howard, | Reading. |
| Durfee, George B., | “ “ | Glover, Albert, | Boston. |
| Dutcher, F. J., | Hopedale. | Glover, Joseph B., | “ |
| D'Wolf, John L., | Boston. | Goddard, A. Warren, | Brookline. |
| | | Goddard, Mrs. M. T., | Newton. |
| Eaton, Horace, | Quincy. | Gorham, James L., | Jamaica Plain. |
| Eldridge, Azariah, | Yarmouthport. | Gould, Francis, | Arlington. |
| Eldridge, E. H., | Boston. | Gould, Samuel, | Boston. |
| Ellicott, J. P., | Jamaica Plain. | Gray, James, | Wellesley. |
| Endicott, William E., | Canton. | Gregory, J. J. H., | Marblehead. |
| Eustis, William C., | Hyde Park. | Greig, George, | Newton. |
| Everett, George, | Concord. | Grinnell, Joseph, | New Bedford. |
| Everett, Otis, | Boston. | Groom, Thomas, | Dorchester. |
| Everett, William, | “ | Grundel Hermann, | “ |
| | | Guild, J. Anson, | Brookline. |
| Fairechild, Charles, | Belmont. | | |
| Farlow, John S., | Newton. | Hadwen, Obadiah B., | Worcester. |
| Faxon, John, | Quincy. | Hall, Edwin A., | Cambridgeport. |
| Fay, Mrs. R. L., | Chelsea. | Hall, George A., | Chelsea. |
| Fenno, J. B., | Boston. | Hall, George R., | Fort George, Fla. |
| Fewkes, Arthur H., | Newton Highl'ds | Hall, John R., | Boston. |
| Fewkes, Edwin, | “ “ | Hall, Lewis, | Cambridge. |
| Fillebrown, John, | Arlington. | Hall, Stephen A., | Revere. |
| Fisher, James, | Boston. | Hall, William F., | Brookline. |
| Fisher, Warren, | “ | Halliday, William H., | Boston. |
| Flagg, Augustus, | “ | Hammond, Gard. G., | “ |
| Fleming, Edwin, | West Newton. | Hammond, Samuel, | “ |
| Fletcher, George V., | Belmont. | Hanson, P. G., | Woburn. |
| Fletcher, J. Henry, | Belmont. | Harding, C. L., | Cambridge. |
| Fletcher, John W., | Chelsea. | Harding, George W., | Dorchester. |
| Flint, Charles L., | Boston. | Harding, Lewis B., | Boston. |
| Flint, David B., | Watertown. | Harding, W. C., | “ |
| Flynt, William N., | Monson. | Hardy, F. D., Jr., | Cambridgeport. |
| Foster, Francis C., | Cambridge. | Harrington, L. B., | Salem. |
| Foster, John H., | Boston. | Harris, Charles, | Cambridge. |
| Fowle, William B., | Auburndale. | Hart, William T., | Boston. |
| Freeland, Chas. Wm., | Boston. | Hastings, Edm. T., | Boston. |
| Freeman, Abraham, | Dorchester. | Hathaway, Seth W., | Marblehead. |
| French, J. D. W., | Boston. | Haughton, James, | Boston. |
| French, Jonathan, | “ | Haven, Alfred W., | Portsm'th, N. H. |
| Fuller, Henry Weld, | “ | Hayes, Daniel F., | Exeter, N. H. |
| | | Hayes, Francis B., | Boston. |
| Galvin, John, | West Roxbury. | Hayward, Daniel H., | No. Cambridge. |
| Gardner, Henry N., | Belmont. | Hazeltine, Hazen, | Boston. |

| | | | |
|------------------------|-----------------|------------------------|-----------------|
| Head, Charles D., | Brookline. | Kendall, J. R., | Woburn. |
| Hilbourn, A. J., | Chelsea. | Kendrick, Mrs. H. P., | Allston. |
| Hill, George, | Arlington. | Kennard, Charles W., | Boston. |
| Hill, John, | Stoneham. | Kennedy, George G., | " |
| Hilton, William, | Boston. | Kent, John, | Charlestown. |
| Hitchings, E. H., | " | Keyes, E. W., | Denver, Col. |
| Hodgkins, John E., | Chelsea. | Keyes, George, | Concord. |
| Hollis, George M., | Grantville. | Kidder, Henry P., | Boston. |
| Hollis, John W., | Brighton. | Kidder, Nath'l T., | " |
| Holt, Mrs. S. A., | Winchester. | Kimball, A. P., | " |
| Hooper, Robert C., | Boston. | King, Franklin, | Dorchester. |
| Hooper, Thomas, | Bridgewater. | Kingman, Abner A., | Brookline. |
| Horner, Mrs. C. N. S., | Georgetown. | Kingman, C. D., | Middleborough. |
| Hovey, Charles H., | Cambridgeport. | Kinney, John M., | Roxbury. |
| Hovey, Charles M., | " | Kinsley, Lyman, | Cambridgeport. |
| Hovey, John C., | " | Kittredge, E. A., | Boston. |
| Hovey, P. Brown, | " | | |
| Howe, George, | Boston. | Lamb, Thomas, | Boston. |
| Howland, John, Jr., | New Bedford. | Lancaster, Charles B., | Newton. |
| Hubbard, Charles T., | Boston. | Lane, John, | E. Bridgewater. |
| Hubbard, G. G., | Cambridge. | Lawrence, Amos A., | Brookline. |
| Hubbard, J. C., | Boston. | Lawrence, Edward, | Charlestown. |
| Hubbard, William J., | " | Lawrence, James, | Groton. |
| Huckins, J. W., | " | Lawrence, John, | Boston. |
| Humphrey, F. J., | Dorchester. | Lee, Henry, | " |
| Humphrey, G. W., | Dedham. | Leeson, Joseph R., | Newton Centre. |
| Hunneman, Jos. H., | Boston. | Lemme, Frederick, | Arlington. |
| Hunnewell, Arthur, | Wellesley. | Leuchars, Robert B., | Boston. |
| Hunnewell, H. H., | " | Lewis, A. S., | Framingham. |
| Hunnewell, Walter, | " | Lewis, William G., | " |
| Hunt, Franklin, | Boston. | Lincoln, George, | Hingham. |
| Hunt, Moses, | " | Locke, William H., | Belmont. |
| Hunt, William H., | Concord. | Lockwood, Rhodes, | Charlestown. |
| Hyde, James F. C., | Newton. | Lodge, Giles H., | Swampscott. |
| | | Loftus, John P., | Newport, R. I. |
| Inches, Henderson, | Boston. | Loomis, Jason B., | Chelsea. |
| Inches, Herman B., | " | Lord, George C., | Newton. |
| | | Loring, Alfred, | South Hingham. |
| Jackson, Abraham, | Boston. | Loring, Caleb W., | Boston. |
| Janvrin, William S., | Revere. | Loring, George B., | Salem. |
| Jeffries, John, Jr., | Boston. | Lovett, George L., | Boston. |
| Jenks, Charles W., | " | Low, Ariel, | " |
| Joyce, Mrs. E. S., | Medford. | Lowder, John, | Watertown. |
| | | Lowell, Augustus, | Boston. |
| Kakas, Edward, | Medford. | Luke, Elijah H., | Cambridgeport. |
| Kendall, D. S., | Woodstock, Ont. | Lumb, William, | Boston. |
| Kendall, Edward, | Cambridgeport. | Lunt, Charles H., | Jamaica Plain. |

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|-----------------------|------------------|------------------------|------------------|
| Lyman, Theodore, | Brookline. | Page, Thomas, | Boston. |
| Lyon, Henry, | Charlestown. | Paine, Robert T., | " |
| | | Palmer, John P., | " |
| Mahoney, John, | Boston. | Park, John C., | Somerville. |
| Mann, James F., | Cambridge. | Parker, Augustus, | Boston. |
| Mann, Jonathan, | " | Parker, Harvey D., | Boston. |
| Manning, Jacob W., | Reading. | Parkman, Francis, | Jamaica Plain. |
| Manning, Mrs. L. B., | Reading. | Partridge, Henry, | Dunkirk, N. Y. |
| Manning, Robert, | Salem. | Partridge, Horace, | Somerville. |
| Mansfield, Henry S., | Blackstone. | Paul, Alfred W., | Dighton. |
| Marshall, Frederick, | Everett. | Peabody, John E., | Salem. |
| Martin, Darius A., | Chelsea. | Pearce, John, | West Roxbury. |
| Martin, John S., | Boston. | Peck, O. H., | Denver, Col. |
| Matthews, Nathan, | " | Peck, W. G., | Arlington. |
| McCarty, Timothy, | Providence, R.I. | Peirce, Silas, | Boston. |
| McClure, John, | Revere. | Penniman, A. P., | Waltham. |
| Merriam, Herbert, | Weston. | Perkins, Augustus T., | Boston. |
| Merriam, M. H., | Lexington. | Perkins, Edward N., | Brookline. |
| Merrifield, W. T., | Worcester. | Perkins, William P., | " |
| Mills, Charles H., | Boston. | Perry, George W., | Malden. |
| Minton, James, | Dorchester. | Philbrick, William D., | Newton Centre. |
| Mixter, Charles, | Boston. | Phillips, John C., | Boston. |
| Moore, John B., | Concord. | Pierce, Dean, | Brookline. |
| Moore, John H., | " | Pierce, George W., | Everett. |
| Morrill, Joseph, Jr., | Boston. | Pierce, Henry L., | Dorchester. |
| Morse, Samuel F., | " | Pierce, Samuel B., | " |
| Morse, Sidney B., | " | Poole, Benjamin C., | Chelsea. |
| Morse, William A., | " | Poor, John R., | Somerville. |
| Motley, Thomas, | West Roxbury. | Potter, Joseph S., | Arlington. |
| Mudge, George A., | Portsm'th, N. H. | Prang, Louis, | Boston. |
| Mudge, George W., | Lynn. | Pratt, Lucius G., | West Newton. |
| Munroe, Otis, | Boston. | Pratt, Robert M., | Boston. |
| | | Pratt, William, | Winchester. |
| Needham, Daniel, | Groton. | Pray, Mark W., | Malden. |
| Newhall, George, | Dorchester. | Prescott, C. H., | Cornwallis, N.S. |
| Newman, J. R., | Winchester. | Prescott, Eben C., | Boston. |
| Newton, Rev. W. W., | Boston. | Prescott, W. G., | " |
| Nickerson, Albert W., | Dedham. | Prescott, William G., | Quincy. |
| Norton, Charles W., | Allston. | Preston, George H., | Boston. |
| Nourse, Benjamin F., | Boston. | Preston, John, | Dorchester. |
| Nourse, Benjamin F., | Cambridgeport. | Pringle, Cyrus G., | Charlotte, Vt. |
| | | Proctor, Thomas P., | West Roxbury. |
| Oakman, Hiram A., | No. Marshfield. | Prouty, Gardner, | Littleton. |
| Osgood, Jas. Ripley, | Boston. | Putnam, Joshua H., | Brookline. |
| Otis, Theodore C., | " | | |
| Oxnard, George D., | " | Ramsay, A. H., | Cambridge. |
| | | Rand, Edward S., | Boston. |
| Packer, Charles H., | Boston. | Rand, Miss E. L., | Newton Highl'ds. |

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|-----------------------|-----------------|-----------------------|------------------|
| Rand, Oliver J., | Cambridgeport. | Smith, Calvin W., | Grantville. |
| Rawson, W. W., | Arlington. | Smith, Charles H., | Jamaica Plain. |
| Ray, James F., | Franklin. | Smith, Chauncey, | Cambridge. |
| Ray, James P., | " | Smith, Edward N., | San Francisco. |
| Ray, Joseph G., | " | Smith, George O., | Boston. |
| Reed, George W., | Boston. | Smith, James H., | Needham. |
| Richards, John J., | " | Smith, W. B., | Boston. |
| Richards, William B., | " | Snow, Eben, | Cambridge. |
| Richardson, C. E., | Cambridge. | Snow, Miss Salome H., | Brunswick, Me. |
| Richardson, Geo. C., | " | Sparhawk, Edw'd C., | Brighton. |
| Rinn, J. Ph., | Boston. | Spaulding, Edward, | Jamaica Plain. |
| Robbins, I. Gilbert, | " | Spaulding, M. D., | Boston. |
| Robbins, Nathan, | Arlington. | Speare, Alden, | Newton Centre. |
| Robeson, W. R., | Boston. | Spencer, Alfred M., | Dorchester. |
| Robinson, John, | Salem. | Springall, George, | Malden. |
| Rogers, John H., | Boston. | Springer, John, | Sterling. |
| Ross, Henry, | Newton. | Stetson, Nahum, | Bridgewater. |
| Ross, M. Denman, | Boston. | Stickney, Rufus B., | Somerville. |
| Ross, Waldo O., | " | Stimpson, George, | New York, N. Y. |
| Ruddick, Dr. Wm. H., | South Boston. | Stimpson, H. H., | Cambridge. |
| Russell, George, | Woburn. | Stone, Amos, | Everett. |
| Russell, John E., | Leicester. | Stone, George F., | Newton. |
| Russell, Walter, | Arlington. | Stone, Phineas J., | Charlestown. |
| | | Story, E. Augustus, | Brighton. |
| Sampson, George R., | New York, N. Y. | Strong, William C., | Newton Highl'ds. |
| Sanborn, Amos C., | Cambridgeport. | Sturgis, John H., | Boston. |
| Sanford, O. S., | Oxford, Md. | Sturgis, Russell Jr., | " |
| Sargent, Charles S., | Brookline. | Sturtevant, E. Lewis, | Geneva, N. Y. |
| Sargent, Ignatius, | " | Sumner, Edward, | Dedham. |
| Saville, Richard L., | " | Surette, Louis A., | Concord. |
| Sawtelle, Eli A., | Boston. | Swain, Charles D., | Roxbury. |
| Sawyer, Timothy T., | Charlestown. | | |
| Scott, Charles, | Newton. | Taft, John B., | Boston. |
| Scudder, C. W., | Brookline. | Tappan, Charles, | " |
| Sears, J. Montgomery, | Boston. | Taylor, Horace B., | " |
| Seaver, Nathaniel, | East Boston. | Thacher, Alfred C., | Dorchester. |
| Seaver, Robert, | Jamaica Plain. | Thayer, Henry, | No. Cambridge. |
| Shaw, C. C., | Milford, N. H. | Thayer, Nathaniel, | Boston. |
| Shaw, S. P., | Cambridge. | Thurlow, Thomas C., | Newburyport. |
| Sheafe, Charles C., | Boston. | Tidd, Marshall M., | Woburn. |
| Sheafe, William, | Brookline. | Tilton, Stephen W., | Boston. |
| Sheldon, Oliver S., | Milton. | Todd, John, | Hingham. |
| Shimmin, Charles F., | Boston. | Tolman, Benjamin, | Concord. |
| Shorey, John L., | Lynn. | Tolman, Miss H. S., | Boston. |
| Skinner, Francis, | Boston. | Torrey, Everett, | Charlestown. |
| Slack, Charles W., | " | Turner, John M., | Dorchester. |
| Smith, Benjamin G., | Cambridge. | Turner, Roswell W., | Boston. |

| | | | |
|----------------------|----------------|----------------------|----------------|
| Turner, Royal W., | Randolph. | Wheelwright, A. C., | Boston. |
| Underwood, Guy C., | Boston. | Whipple, John A., | " |
| Upham, Henry, | Brookline. | Whitcomb, Wm. B., | Medford. |
| | | White, Benjamin C., | Boston. |
| | | White, Edward A., | " |
| Vass, William J., | Brookline. | White, Francis A., | Brookline. |
| Vose, Benjamin C., | Hyde Park. | Whitely, Edward, | Cambridge. |
| | | Whiting, Nathaniel, | Brookline. |
| | | Whitmore, C. O., | Boston. |
| Wainwright, Wm. L., | Braintree. | Whittle, George W., | Somerville. |
| Wakefield, E. H., | Chelsea. | Whytal, Thomas G., | New York, N.Y. |
| Walcott, Edward, | Pawtucket. | Wilbur, G. B., | Watertown. |
| Walcott, Henry P., | Cambridge. | Wilcutt, Levi L., | West Roxbury. |
| Wales, George O., | Braintree. | Wilder, Edw. Baker, | Dorchester. |
| Walker, Edw. C. R., | Dedham. | Wilder, Henry A., | Boston. |
| Walker, Samuel A., | " | Wilder, Marshall P., | Dorchester. |
| Walker, T. W., | Waltham. | Willard, E. W., | Newport, R. I. |
| Walley, Mrs. W. P., | Boston. | Williams, Aaron D., | Boston. |
| Ward, John, | Newton. | Williams, Benj. B., | " |
| Wardwell, W. H., | Newton Centre. | Williams, Philander, | Taunton. |
| Ware, Benjamin P., | Beach Bluff. | Willis, George W., | Chelsea. |
| Warren, George W., | Boston. | Willis, J. C., | Boston. |
| Washburn, Andrew, | Hyde Park. | Wilson, Henry W., | South Boston. |
| Wason, Elbridge, | Brookline. | Wilson, Wm. Power, | Boston. |
| Waters, Edwin F., | Newton Centre. | Winship, F. Lyman, | Brighton. |
| Watts, Isaac, | Newton. | Woerd, Charles V., | Waltham. |
| Webber, Aaron D., | Belmont. | Woerd, C. V., Jr., | " |
| Weld, Aaron D., | Boston. | Wood, Luke H., | Marlborough. |
| Weld, George W., | Newport, R. I. | Wood, R. W., | Jamaica Plain. |
| Weld, Dr. Moses W., | West Roxbury. | Wood, William K., | West Newton. |
| Weld, Richard H., | Boston. | Woods, Henry, | Dorchester. |
| Weld, William G., | " | Woodward, Royal, | Brookline. |
| West, Mrs. Maria L., | Brookline. | Wright, George C., | West Acton. |
| Weston, Leonard W., | Lincoln. | Wrisley, Frank, | New York, N.Y. |
| Weston, Seth, | Revere. | | |
| Wetherell, Leander, | Boston. | | |

ANNUAL MEMBERS.

| | | | |
|-----------------------|-------------------|-------------------------|----------------|
| Abbott, S. L., M. D., | Boston. | Burley, Edward, | Beverly. |
| Adams, C. S., | Framingham. | Burr, Charles C., | Newton. |
| Allen, Andrew F., | Arlington. | Butler, Edward, | Wellesley |
| Allen, Calvin, | Boston. | | |
| Allen, C. L., | GardenCity, N. Y. | Capen, Aaron D., | Mattapan. |
| Ames, R. W., | Boston. | Carter, Maria E., | Woburn. |
| Anderson, Charles J., | Longwood. | Cartwright, James, | Wellesley. |
| Atkinson, Chas. M., | Brookline. | Chadbourne, M. W., | Watertown. |
| Atkinson, Edward, | “ | Chaffin, John C., | Newton. |
| Atkinson, W. B., | Newburyport. | Chapin, Gardner S., | Arlington. |
| | | Chapin, George H., | Watertown. |
| Bacon, Augustus, | Boston. | Chase, Joseph S., | Malden. |
| Bacon, William, | “ | Cheney, Amos P., | South Natick. |
| Badlam, William H., | Dorchester. | Clark, James W., | Framingham. |
| Bard, James, | Framingham. | Clark, Joseph, | Manchester. |
| Barker, John G., | Lynn. | Clark, Joseph W., | Dedham. |
| Batchelder, G. W., | Dorchester. | Cobb, Jonathan H., | “ |
| Beard, Edward L., | Cambridge. | Coe, Henry F., | West Roxbury. |
| Beebe, J. Arthur, | Boston. | Collins, Frank S., | Malden. |
| Beer, Carl, | Groton. | Comley, James, | Lexington. |
| Bird, John L., | Dorchester. | Cox, James F., | Abington. |
| Bliss, B. K., | New York. | Crafts, William A., | Boston. |
| Bock, William A., | No. Cambridge. | Crosby, J. Allen, | Jamaica Plain. |
| Bolles, Matthew, | Boston. | Cruickshanks, J. T., | Natick. |
| Bolles, William P., | “ | Curtis, Daniel T., | Boston. |
| Bolton, John B., | Somerville. | Curtis, Joseph H., | “ |
| Boott, William, | Boston. | | |
| Bottomly, Robert, | Belmont. | Darling, Moses, Jr., | South Boston. |
| Bowditch, E. Francis, | Framingham. | Davenport, A. M., | Watertown. |
| Bowditch, James H., | Brookline. | Davis, Frederick, | Newton. |
| Bradlee, John T., | Boston. | Davis, Thomas M., | Cambridgeport. |
| Breck, Charles H., | Brighton. | Demar, John A., | Lexington. |
| Breck, Charles H. B., | “ | Dolbear, Mrs. Alice J., | Somerville. |
| Brooks, George, | Brookline. | Doogue, William, | Boston. |
| Brown, A. S., | Jamaica Plain. | Duffley, Daniel, | Brookline. |
| Brown, Atherton T., | Boston. | Dunn, Thomas, | Newport, R. I. |
| Brown, Benjamin F., | Charlestown. | Dupee, James A., | Brookline. |
| Brown, Jona., Jr., | Somerville. | | |
| Brown, Joseph T., | Boston. | Eaton, Jacob, | Cambridgeport. |
| Bullard, George B., | Hingham. | Edgar, William, | Newtonville. |

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|------------------------|----------------|-------------------------|-----------------|
| Falconer, John, | Rochester. | Hatch, Samuel, | Boston. |
| Falconer, William, | Glencove, N.Y. | Hayes, John L., | Cambridge. |
| Farrier, Mrs. C., | Stoneham. | Hayward, George P., | Hingham. |
| Faxon, Edwin, | Jamaica Plain. | Hazleton, H. L., | Boston. |
| Faxon, M. B., | Melrose. | Hersey, Alfred H., | Hingham. |
| Felton, Arthur W., | West Newton. | Hersey, Edmund, | " |
| Fenno, Warren, | Revere. | Heustis, Warren, | Belmont. |
| Fisher, Sewall, | Framingham. | Hewins, James, | Medfield. |
| Fletcher, Edwin, | Acton. | Hews, Albert H., | No. Cambridge. |
| Foster, Joshua T., | Medford. | Hill, Benjamin D., | Peabody. |
| Fowle, Charles L., | Dorchester. | Hill, Miss Katie A., | Lowell. |
| Fowle, George W., | Jamaica Plain. | Hinckley, Mrs. D. F., | Chelsea. |
| French, William E., | Boston. | Howe, Rufus, | Marlborough. |
| Frohock, Roscoe R., | Malden. | | |
| Frost, George, | West Newton. | Ireland, George W., | Somerville. |
| Frost, Stiles, | Boston. | | |
| Fuller, T. Otis, | Needham. | Jameson, G. W., | East Lexington. |
| | | Jones, Moses, | Brookline. |
| Gane, Henry A., | West Newton. | Jordan, Samuel, | Yarmouth. |
| Gardiner, Claudius B., | Newburyport. | Judkins, Rev. B., | West Dedham. |
| Gardner, John, | Boston. | | |
| Garfield, Charles, | Medford. | Kelley, George B., | Jamaica Plain. |
| Gaut, Samuel N., | Somerville. | Kelsey, Fred W., | Waverly, N. Y. |
| Gilbert, John, | Boston. | Kendall, Jonas, | Framingham. |
| Gilbert, Samuel, | " | Kennard, Martin P., | Brookline. |
| Gilbert, W. A., | Neponset. | Kenrick, Miss A. C., | Newton. |
| Gill, Mrs. E. M., | Medford. | | |
| Gleason, Herbert, | Malden. | Lamprell, Simon, | Marblehead. |
| Godbold, G. A., | Chelsea. | Lang, John H. B., | Dorchester. |
| Goddard, Thomas, | Boston. | Langmaid, Mrs. Mary, | Somerville. |
| Goodwin, Lester, | Brighton. | Langworthy, Rev. I. P., | Chelsea. |
| Gould, William P., | Jamaica Plain. | Leavens, E. W., | Malden. |
| Grant, Charles E., | Concord. | Lee, Charles J., | Dorchester. |
| Gray, Howard, | Dorchester. | Lee, Francis H., | Salem. |
| Gray, William, Jr., | " | Livermore, Miss M., | Mount Auburn. |
| Gray, William, 3d, | " | Loring, Charles G., | Boston. |
| Greene, Malcolm C., | " | Loring, John A., | " |
| Grew, Henry, | Hyde Park. | Lothrop, David W., | West Medford. |
| Grover, William O., | Boston. | Lothrop, H. A., | Sharon. |
| Guerineau, Louis, | Malvern, Ark. | Lothrop, Thornton K., | Boston. |
| | | Lowell, John, | Newton. |
| Hall, William T., | Revere. | | |
| Hamlin, Delwin A., | South Boston. | Marcou, Mrs. J., | Cambridge. |
| Harris, Miss Ellen M., | Jamaica Plain. | Markoe, G. F. H., | Boston. |
| Harris, Frederick L., | South Natick. | May, F. W. G., | Boston. |
| Hartwell, Samuel, | Lincoln. | McDermott, Andrew, | " |
| Harwood, George S., | Newton. | McIntosh, A. S., | " |

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|------------------------|------------------|------------------------|-----------------|
| McLaren, Anthony, | Forest Hills. | Safford, Nathaniel F., | Milton. |
| Mellen, George M., | Brookline. | Saunders, Miss M. T., | Salem. |
| Meriam, Dr. H. C., | Salem. | Saville, George, | Quincy. |
| Merrill, J. Warren, | Cambridgeport. | Sawtell, J. M., | Fitchburg. |
| Merrill, S. A., | Wollaston. | Schlegel, Adam, | Boston. |
| Mills, William, | Somerville. | Schmitt, Georg A., | Brookline. |
| Minton, Peter J., | Forest Hills. | Scott, A. E., | Lexington. |
| Morandi, Francis, | Malden. | Scott, George H., | Allston. |
| Morandi, Francis W., | " | Scudder, Samuel H., | Cambridge. |
| Morton, James H., | Boston. | Shattuck, F. R., | Boston. |
| Murray, Daniel D., | Brookline. | Shedd, Abraham B., | Lexington. |
| Muzzey, Rev. A. B., | Cambridge. | Shedd, Arthur B., | Chicago, Ill. |
| | | Sheppard, Edwin, | Lowell. |
| Nightingale, Crawford, | Dorchester. | Sheppard, S. A. D., | Newton. |
| Norton, Michael H., | Boston, | Simpson, Michael H., | Saxonville. |
| Norton, Patrick, | " | Snow, Eugene A., | Melrose. |
| | | Southworth, Edward, | Quincy. |
| O'Brien, James, | Jamaica Plain. | Spooner, William H., | Jamaica Plain. |
| | | Sprague, Charles J., | Boston. |
| Park, William D., | Boston. | Squire, John P., | Arlington. |
| Parker, John, | " | Starbird, Louis D., | Malden. |
| Parsons, William, | " | Stevenson, Hamilton, | Woburn. |
| Patterson, James, | Cambridge. | Stone, Eliphalet, | Dedham. |
| Payson, Samuel R., | Boston. | Stone, Samuel G., | Charlestown. |
| Phillips, Nathaniel, | Dorchester. | Storer, Charles, | Natick. |
| Pickering, Mrs. E. C., | Cambridge. | Story, Miss Sarah W., | Brighton. |
| Pierce, Samuel H., | Lincoln. | Strahan, Thomas, Jr., | Chelsea. |
| Plimpton, W. P., | West Newton. | Sullivan, J. L. D., | Somerville. |
| Power, Charles J., | S. Framingham. | Swan, Charles W., | Boston. |
| Pratt, Mrs. Mary L., | Hingham. | | |
| Prince, Thomas, | Boston. | Tailby, Joseph, | Wellesley. |
| Purdie, George A., | Wellesley Hills. | Talbot, Josiah W., | Norwood, |
| Putnam, Charles A., | Salem. | Tapper, Thomas, | Canton. |
| Putnam, Henry W., | " | Terwilliger, S. F., | Saratoga, N. Y. |
| | | Tobey, Miss M. B., | Brookline, |
| Randall, Macey, | Sharon. | Torrey, Bradford, | Boston. |
| Ranlett, S. A., | Melrose. | Trautman, Martin, | " |
| Richards, John S., | Brookline. | Turner, Nathaniel W. | " |
| Richardson, E. P., | Lawrence. | | |
| Richardson, Horace, | Framingham. | Underwood, Wm. J., | Belmont. |
| Richardson, S. W., | Boston. | | |
| Ridler, Charles E., | Kingston. | Van der Veur, P. W., | New York, N. Y. |
| Roberts, Edward, | Hyde Park. | Vaughan, J. C., | Chicago, Ill. |
| Rogers, John F., | Cambridge. | | |
| Ross, Charles W., | Newtonville. | Walker, Charles H., | Chelsea. |
| | | Walker, Joseph T., | Boston. |
| Safford, Fred'k M., | Dorchester. | Walker, William P., | Somerville. |

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|-----------------------|-----------------|-------------------------|----------------|
| Waterer, Hosea, | South Natick. | Wilmarth, Henry D., | Jamaica Plain. |
| Webster, John, | Salem. | Wilson, B. Osgood, | Watertown. |
| Weld, Francis M., | Jamaica Plain. | Wilson, George W., | Malden. |
| Wellington, Jos. V., | Cambridge. | Wiswall, Henry M., | Watertown. |
| Wells, Benjamin T., | Boston. | Withington, Henry H., | Jamaica Plain. |
| Weston, Mrs. L. P., | Danvers. | Wolcott, Mrs. H. L. T., | Boston. |
| Wheatland, Henry, | Salem. | Wood, Mrs. Anna D., | West Newton. |
| Wheeler, Miss Ann C., | Cambridgeport. | Wood, E. W., | “ “ |
| Wheildon, Wm. W., | Concord. | Woodford, Jos. H., | Newton. |
| White, Nelson B., | Norwood. | Woolson, George C., | Passaic, N. J. |
| Whitney, Joel, | Winchester. | Wright, Daniel, | Lowell. |
| Whiton, Starkes, | Hingham Centre. | Zirngiebel, Denys, | Needham. |
| Wilde, Hiram, | Randolph. | | |

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXVI. — LIFE MEMBERS.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member having once paid an admission fee, may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII. — ADMISSION FEE AND ANNUAL ASSESSMENT.

Every subscription member, before he receives his Diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX. — DISCONTINUANCE OF MEMBERSHIP.

Any member who shall neglect for the space of two years to pay his annual assessment, shall cease to be a member of the Society, and the Treasurer shall erase his name from the List of Members.

The attention of Annual Members is particularly called to Section XXIX.

HONORARY MEMBERS.

*A * denotes the member deceased. Correspondents of the Society and others will confer a favor by communicating to the Secretary information of the decease, change of residence, etc., of Honorary or Corresponding Members.

*BENJAMIN ABBOTT, LL. D., Exeter, N. H.

*JOHN ABBOTT, Brunswick, Me.

*HON. JOHN QUINCY ADAMS, LL. D., late President of the United States,
Quincy.

*PROFESSOR LOUIS AGASSIZ, Cambridge.

*WILLIAM T. AITON, late Curator of the Royal Gardens, Kew, England.

*THOMAS ALLEN, late President of the St. Louis Horticultural Society, St.
Louis, Mo., and Pittsfield, Mass.

*HON. SAMUEL APPLETON, Boston.

*HON. JAMES ARNOLD, New Bedford.

*EDWARD NATHANIEL BANCROFT, M. D., late President of the Horticultural
and Agricultural Society of Jamaica.

*HON. PHILIP P. BARBOUR, Virginia.

*DON ANGEL CALDERON DE LA BARCA, late Spanish Minister at Washington.

*ROBERT BARCLAY, Bury Hill, Dorking, Surrey, England.

*JAMES BEEKMAN, New York.

*L'ABBE BERLÈSE, Paris.

*NICHOLAS BIDDLE, Philadelphia.

*DR. JACOB BIGELOW, Boston.

*MRS. LUCY BIGELOW, Medford.

*LE CHEVALIER SOULANGE BODIN, late Secrétaire Général de la Société
d'Horticulture de Paris.

HON. GEORGE S. BOUTWELL, Groton.

*JOSIAH BRADLEE, Boston.

*HON. GEORGE N. BRIGGS, Pittsfield.

*HON. JAMES BUCHANAN, late President of the United States, Lancaster,
Penn.

*JESSE BUEL, late President of the Albany Horticultural Society, Albany,
N. Y.

*HON. EDMUND BURKE, late Commissioner of Patents, Washington, D. C.

*AUGUSTIN PYRAMUS DE CANDOLLE, Geneva, Switzerland.

HON. HORACE CAPRON, Ex-U. S. Commissioner of Agriculture, Washington,
D. C.

*COMMODORE ISAAC CHAUNCEY, U. S. Navy, Brooklyn, N. Y.

- *WARD CHIPMAN, late Chief Justice of New Brunswick, St. John.
- *LEWIS CLAPIER, Philadelphia.
- *HON. HENRY CLAY, Lexington, Ky.
- H. W. S. CLEVELAND, Chicago, Ill.
- *ADMIRAL SIR ISAAC COFFIN, Bart., England.
- *ZACCHEUS COLLINS, late President of the Pennsylvania Horticultural Society, Philadelphia.
- *ROSWELL L. COLT, Paterson, N. J.
- CALEB COPE, Ex-President of the Pennsylvania Horticultural Society, Philadelphia.
- *WILLIAM COXE, Burlington, N. J.
- *JOHN P. CUSHING, Watertown.
- *CHARLES W. DABNEY, late U. S. Consul, Fayal, Azores.
- *HON. JOHN DAVIS, LL. D., Boston.
- *SIR HUMPHRY DAVY, London.
- *GEN. HENRY ALEXANDER SCAMMEL DEARBORN, Roxbury.
- *JAMES DICKSON, late Vice-President of the Horticultural Society of London.
- *MRS. DOROTHY DIX, Boston.
- *CAPT. JESSE D. ELLIOT, U. S. Navy.
- *HON. STEPHEN ELLIOT, LL. D., Charleston, S. C.
- *HON. HENRY L. ELLSWORTH, late Commissioner of Patents, Washington, D. C.
- *ALLYN CHARLES EVANSON, late Secretary of the King's County Agricultural Society, St. John, N. B.
- *HON. EDWARD EVERETT, LL. D., Boston.
- *HON. HORACE EVERETT, Vermont.
- *F. FALDERMANN, late Curator of the Imperial Botanic Garden, St. Petersburg.
- *HON. MILLARD FILLMORE, late President of the United States, Buffalo, N. Y.
- *DR. F. E. FISCHER, late Professor of Botany at the Imperial Botanic Garden, St. Petersburg.
- *HON. THEODORE FRELINGHUYSEN, late President of the American Agricultural Society, New Brunswick, New Jersey.
- *JOSEPH GALES, JR., late Vice-President of the Horticultural Society, Washington, D. C.
- *GEORGE GIBBS, New York.
- *STEPHEN GIRARD, Philadelphia.
- *HON. ROBERT T. GOLDSBOROUGH, Talbot County, Maryland.
- *EPHRAIM GOODALE, South Orrington, Maine.
- *MRS. REBECCA GORE, Waltham.
- *HON. JOHN GREIG, late President of the Domestic Horticultural Society, Canandaigua, N. Y.
- *MRS. MARY GRIFFITH, Charlies Hope, N. J.
- *GEN. WILLIAM HENRY HARRISON, late President of the United States, North Bend, Ohio.
- *S. P. HILDRETH, M. D., Marietta, Ohio.
- *THOMAS HOPKIRK, late President of the Glasgow Horticultural Society.
- *DAVID HOSACK, M. D. late President of the New York Horticultural Society.

- *LEWIS HUNT, Huntsburg, Ohio.
- *JOSEPH R. INGERSOLL, late President of the Pennsylvania Horticultural Society, Philadelphia.
- *GEN. ANDREW JACKSON, late President of the United States, Nashville, Tenn.
- *MRS. MARTHA JOHONNOT, Salem.
- *JARED POTTER KIRTLAND, M. D., LL. D., East Rockport, Ohio.
- *THOMAS ANDREW KNIGHT, late President of the Horticultural Society of London.
- *GEN. LA FAYETTE, La Grange, France.
- *LE COMTE DE LASTEYRIE, late Vice-President of the Horticultural Society of Paris.
- L. A. H. LATOUR, M. P., Montreal, Canada.
- *BARON JUSTUS LIEBIG, Giessen, Germany.
- *PROF. JOHN LINDLEY, late Secretary of the Horticultural Society of London.
- FRANKLIN LITCHFIELD, U. S. Consul at Puerto Cabello, Venezuela.
- *JOSHUA LONGSTRETH, Philadelphia.
- *NICHOLAS LONGWORTH, Cincinnati, Ohio.
- *JACOB LORILLARD, late President of the New York Horticultural Society.
- *JOHN C. LOUDON, London.
- *HON. JOHN A. LOWELL, Boston.
- *BARON CHARLES FERDINAND HENRY VON LUDWIG, late Vice-President of the South African Literary and Scientific Institution, Cape Town, Cape of Good Hope.
- *HON. THEODORE LYMAN, Brookline.
- COL. THEODORE LYMAN, Brookline.
- *HON. JAMES MADISON, late President of the United States, Montpelier, Va.
- *MRS. CHARLOTTE MARRYATT, Wimbledon, near London.
- JOSEPH MAXWELL, Rio Janeiro.
- D. SMITH McCAULEY, U. S. Consul-General, Tripoli.
- *HON. ISAAC MCKIM, late President of the Horticultural Society of Maryland, Baltimore.
- REV. JAMES H. MEANS, Dorchester, Mass.
- *JAMES MEASE, M. D., Philadelphia.
- *LEWIS JOHN MENTENS, Brussels, Belgium.
- *HON. CHARLES F. MERCER, Virginia.
- *FRANÇOIS ANDRÉ MICHAUX, Paris.
- DONALD G. MITCHELL, New Haven, Conn.
- *SAMUEL L. MITCHILL, M. D., LL. D., New York.
- *HON. JAMES MONROE, late President of the United States, Oak Hill, Va.
- *ALFRED S. MONSON, M. D., late President of the New Haven Horticultural Society, New Haven, Conn.
- *HON. A. N. MORIN, Montreal, Canada.
- *THÉODORE MOSSELMANN, Antwerp, Belgium.
- BARON R. VON OSTEN SACKEN, Heidelberg, Germany.
- BARON OTTENFELS, Austrian Minister to the Ottoman Porte.
- JOHN PALMER, Calcutta.

- *HON. JOEL PARKER, LL. D., Cambridge.
SAMUEL B. PARSONS, Flushing, N. Y.
- *HON. THOMAS H. PERKINS, Brookline.
- *A. POITEAU, late Professor in the Institut Horticole de Fromont.
- *HON. JAMES K. POLK, late President of the United States, Nashville, Tenn.
- *JOHN HARE POWEL, Powelton, Pa.
- *HENRY PRATT, Philadelphia.
- *WILLIAM PRINCE, Flushing, N. Y.
- *REV. GEORGE PUTNAM, D. D., Roxbury.
- *COL. JOEL RATHBONE, late President of the Albany and Rensselaer Horticultural Society, Albany, N. Y.
- *ARCHIBALD JOHN, Earl of Roseberry, late President of the Caledonian Horticultural Society.
- *JOSEPH SABINE, late Secretary of the Horticultural Society of London.
- *DON RAMON DE LA SAGRA, Havana, Cuba.
- *HENRY WINTHROP SARGENT, Fishkill, N. Y.
- *SIR WALTER SCOTT, Abbotsford, Scotland.
- *JOHN SHEPHERD, late Curator of the Botanic Garden, Liverpool, England.
- *JOHN S. SKINNER, late Editor of the American Farmer, Baltimore, Md.
GEORGE W. SMITH, Boston.
- *STEPHEN H. SMITH, late President of the Rhode Island Horticultural Society.
- *HON. CHARLES SUMNER, Boston.
- *HON. JOHN TALIAFERRO, Virginia.
- *GEN. JAMES TALMADGE, late President of the American Institute, N. Y.
- *GEN. ZACHARY TAYLOR, late President of the United States, Baton Rouge, La.
- *JAMES THACHER, M. D., Plymouth.
JOHN J. THOMAS, Union Springs, N. Y.
- *JAMES W. THOMPSON, M. D., Wilmington, Del.
- *GRANT THORBURN, New York.
- *M. DU PETIT THOUARS, Paris.
- *LE VICOMTE HÉRICART DE THURY, late President of the Horticultural Society of Paris.
- *MONS. TOUGARD, late President of the Horticultural Society of Rouen, France.
- *GEN. NATHAN TOWSON, late President of the Horticultural Society, Washington, D. C.
- *HON. JOHN TYLER, late President of the United States, Williamsburg, Va.
- *REV. JOSEPH TYSO, Wallingford, England.
- *HON. MARTIN VAN BUREN, late President of the United States, Kinderhook, N. Y.
- *FEDERAL VANDERBURG, M. D., New York.
- *JEAN BAPTISTE VAN MONS, M. D., Brussels, Belgium.
- *GEN. STEPHEN VAN RENSSELAER, Albany, N. Y.
- *JOSEPH R. VAN ZANDT, Albany, N. Y.
- *BENJAMIN VAUGHAN, M. D., Hallowell, Me.
- *PETTY VAUGHAN, London.

- *REV. N. VILLENEUVE, Montreal, Canada.
- *PIERRE PHILIPPE ANDRÉ VILMORIN, Paris.
- *JAMES WADSWORTH, Geneseo, N. Y.
- *NATHANIEL WALLICH, M. D., late Curator of the Botanic Garden, Calcutta.
- *MALTHUS A. WARD, M. D., late Professor in Franklin College, Athens, Ga.
- *HON. DANIEL WEBSTER, Marshfield.
- *HON. JOHN WELLES, Boston.
- *JEREMIAH WILKINSON, Cumberland, R. I.
HON. ROBERT C. WINTHROP, Boston.
- *FREDERICK WOLCOTT, Litchfield, Conn.
- *ASHTON YATES, Liverpool, England.
- *LAWRENCE YOUNG, late President of the Kentucky Horticultural Society,
Louisville.

CORRESPONDING MEMBERS.

A * denotes the members deceased.

- *JOHN ADLUM, Georgetown, D. C.
- *DON FRANCISCO AGUILAR Y LEAL, U. S. Vice-Consul at Maldonado, Banda Oriental del Uruguay.
- *MONS. ALFROY, Lieusaint, France.
JAMES T. ALLAN, Ex-President of the Nebraska State Horticultural Society, Omaha, Neb.
A. B. ALLEN, New York.
- *REV. THOMAS D. ANDERSON, D.D., South Boston.
- *THOMAS APPLETON, late U. S. Consul at Leghorn, Italy.
- *COL. THOMAS ASPINWALL, late U. S. Consul at London, Brookline.
P. M. AUGUR, State Pomologist, Middlefield, Conn.
- *ISAAC COX BARNET, late U. S. Consul at Paris.
PATRICK BARRY, Ex-Chairman of the General Fruit Committee of the American Pomological Society, Rochester, N. Y.
- *AUGUSTINE BAUMANN, Bolwiller, Alsace.
- *EUGÈNE ACHILLE BAUMANN, Rahway, N. J.
- *JOSEPH BERNARD BAUMANN, Bolwiller, Alsace.
NAPOLEON BAUMANN, Bolwiller, Alsace.
D. W. BEADLE, St. Catherine's, Ontario.
PROFESSOR W. J. BEAL, Lansing, Michigan.
- *NOEL J. BECAR, Brooklyn, N. Y.
- *EDWARD BECK, Worton College, Isleworth, near London.
REV. HENRY WARD BEECHER, Peekskill, N. Y.
- *LOUIS ÉDOUARD BERCKMANS, Rome, Ga.
PROSPER J. BERCKMANS, Augusta, Ga.
- *ALEXANDER BIVORT, late Secretary of the Société Van Mons, Fleurus, Belgium.
- *TRIPET LE BLANC, Paris.
- *CHARLES D. BRAGDON, Pulaski, Oswego Co., N. Y.
- *WILLIAM D. BRINCKLÉ, M. D., Philadelphia.
- *GEORGE BROWN, late U. S. Commissioner to the Sandwich Islands, Beverly.
- *JOHN W. BROWN, Fort Gaines, Ga.
- *DR. NEHEMIAH BRUSH, East Florida.
- *ARTHUR BRYANT, SR., late President of the Illinois State Horticultural Society, Princeton, Ill.
- *ROBERT BUIST, Philadelphia.
- *DR. E. W. BULL, Hartford, Conn.
WILLIAM BULL, Chelsea, England.

- REV. ROBERT BURNET, Ex-President of the Ontario Fruit Growers' Association, Pictou, N. S.
- ALEXANDER BURTON, United States Consul at Cadiz, Spain.
- ISIDOR BUSH, Bushberg, Jefferson Co., Mo.
- GEORGE W. CAMPBELL, Delaware, Ohio.
- *FRANCIS G. CARNES, New York.
- *COL. ROBERT CARR, Philadelphia.
- *REV. JOHN O. CHOULES, D. D., Newport, R. I.
- *REV. HENRY COLMAN, Boston.
- *JAMES COLVILL, Chelsea, England.
- BENJAMIN E. COTTING, M. D., Boston.
- *SAMUEL L. DANA, M. D., Lowell.
- *J. DECAISNE, late Professeur de Culture au Muséum d'Histoire Naturelle, Jardin des Plantes, Paris.
- *JAMES DEERING, Portland, Me.
- *H. F. DICKEHUT.
- *SIR C. WENTWORTH DILKE, Bart., London.
- *HON. ALLEN W. DODGE, Hamilton.
- REV. H. HONYWOOD D'OMBRAIN, Westwell Vicarage, Ashford, Kent, England.
- *ANDREW JACKSON DOWNING, Newburg, N. Y.
- CHARLES DOWNING, Newburg, N. Y.
- PARKER EARLE, Cobden, Ill.
- *F. R. ELLIOTT, late Secretary of the American Pomological Society, Cleveland, Ohio.
- GEORGE ELLWANGER, Rochester, N. Y.
- *GEORGE B. EMERSON, LL. D., Winthrop.
- *EBENEZER EMMONS, M. D., Williamstown.
- *ANDREW H. ERNST, Cincinnati, O.
- *NATHANIEL FELLOWS, Cuba.
- *HENRY J. FINN, Newport, R. I.
- *W. C. FLAGG, late Secretary of the American Pomological Society, Moro, Ill.
- *MICHAEL FLOY, late Vice-President of the New York Horticultural Society, New York City.
- *JOHN FOX, Washington, D. C.
- *HON. RUSSELL FREEMAN, Sandwich.
- ANDREW S. FULLER, Ridgewood, N. J.
- HENRY WELD FULLER, Roxbury.
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A HISTORY

OF

AMERICAN HORTICULTURE.

The attention of Trustees and Librarians of Public Libraries, and of Horticulturists generally, is called to the History of the Massachusetts Horticultural Society, for fifty years, from its foundation in 1829. This work will be found of general interest, as the introduction comprises a sketch, much fuller than exists elsewhere, of the History of Horticulture in the United States, from the settlement of the country to the foundation of the Society, and the history of the Society onward is, in the language of President Hovey, in his address at the dedication of the present Hall of the Society, "the History of Horticulture in our country." It is handsomely printed, on an extra quality of paper, and embellished with a fine steel engraving of Gen. H. A. S. Dearborn, the first President, and heliotypes of the two Halls erected by the Society. Among other interesting matters, it contains an account of the foundation by the Society of Mount Auburn Cemetery, the parent of all similar cemeteries in the country.

The work is furnished to members of the Society, at cost, \$2.50. and to others than members for \$3, but will be supplied to public libraries and booksellers at the same price as to members. Please address the Secretary of the Society, at Horticultural Hall, Boston.

ROBERT MANNING,

Secretary.

