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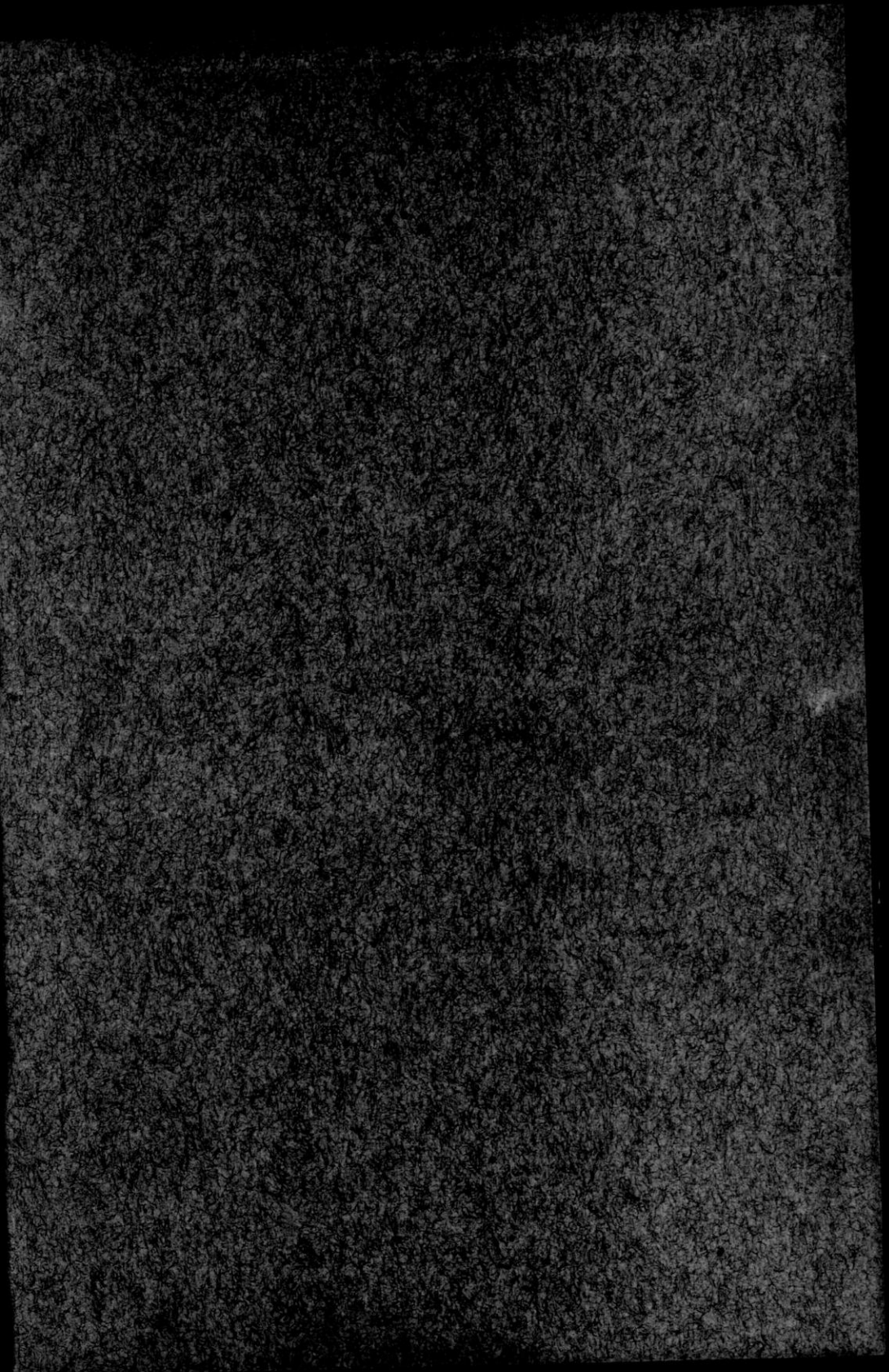
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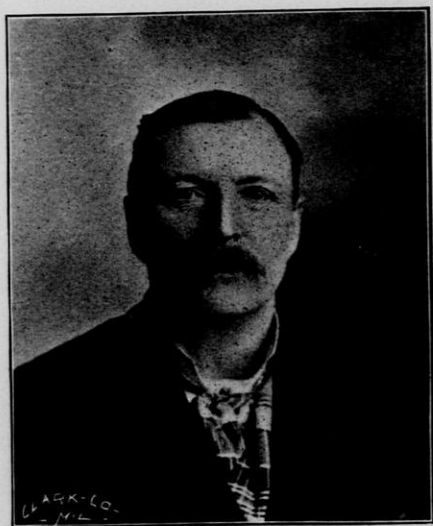
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PRESIDENT T. E. LOOPE.

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The Wisconsin Horticulturist.

VOL. VII.

MARCH, 1902.

No. I.

PRESIDENT OF THE W. S. H. S.

PRESIDENT T. E. LOOPE became ensnarled in horticultural work in 1884, when he entered into partnership with Mr. A. A. Parsons. Starting in with about six acres of small fruit, they increased their acreage to about twenty in the spring of 1885. In 1892 they planted 1000 Duchess, and supplemented in the following two years with Wealthy, Longfield and McMahon White to about 3500 trees.

In 1890 they planted 40 acres of small fruits near Rochester, Minn. In 1893, the frost, in June, destroyed the crop and the plantation never fully recovered. They sold out and concluded Wisconsin was the best place to grow fruit.

President Loope has always been cheerful, and above all hopeful, even under the most discouraging circumstances. At the present writing he is trying to purchase 40 acres adjoining their orchard and intends planting it all to winter varieties. He is somewhat of a crank on flowers.

His determination to succeed in whatever he undertakes is shown by the success he had with the State Commission in securing the funds for the exhibit the Society made at Buffalo. He is now bending his efforts towards securing an appropriation for the Society, to be used at the Louisiana Purchase Exposition, and from reports already received, thinks he will succeed.

One of his greatest pleasures is wandering about the orchard and figuring up the profits that never seem to come.

He is a life member, and was elected President of the State Society in 1901, and re-elected in 1902.

THE SPRAYING OF PLANTS.

By F. H. WEBSTER, WOOSTER, OHIO.

Less than forty years ago, the spraying of plants with insecticides or fungicides was unknown, and, if even thought of, was not seriously contemplated as being a part of good husbandry. A spraying machine in those days would have excited almost as much curiosity as would a telephone, or a modern typewriter. There was, indeed, less need for such a machine, west of the Allegheny mountains, at least. The need of insecticides and fungicides, and the machinery necessary for their application, has come to us with the advance of civilization, and followed the destruction of the forests, the prairie flora, the wild animals and the dusky aborigine. They are the outcome, either direct or indirect, of our more intense civilization, and must not only be adopted by the successful fruit grower or farmer, as a part of his business, but he must improve upon them, precisely as he improves upon the varieties of his fruits and the breeds of his domestic animals, and for the same reasons. He must produce, continually, more perfect fruit, more desirable vegetables, more tender and juicy beef, and better horses, else he cannot dispose of them profitably to his fellow man, who needs them and is able to pay for whatever he needs.

WHY SPRAYING BECAME NECESSARY.

There are three prime reasons which have made spraying not only necessary, but in many cases absolutely imperative, if success is to be secured. These are, (1), the destruction of the food plants of many of our now destructive native insects, and the replacing of these, in large areas plants of quite similar nature, (2), the weakening of our trees plants and vines by hybridization, cultivation, grafting and budding, and, (3), by the importation of varieties quite similar to those indigenous to our country, but more susceptible to attack from our native insect pests and plant diseases.

The clearing up of the native forests where native fruits were produced, and the destruction by similar methods of many of the food plants of leaf-eating insects, has driven these to the cultivated vegetation, because these insects had no where else to go, and it was a case of either adapting themselves to a slight change of food, or perish.

The plum curculio no longer confines itself to the wild plum,

though it does return, if possible, to the woodlands there to pass the winter among the fallen leaves; but the plum orchard of the horticulturist offers a better feeding ground, with larger and more attractive varieties than the wild plums of the woodlands. The insect is enabled to breed more unrestrained, and a greater supply of food is offered it, than was possible under the old existing conditions. The inroads of birds upon its numbers in the primeval woods are now greatly reduced, and the few trees that happen to be located in an occasional chicken park, are the only ones where there is much trouble from feathered enemies. If there are not plums enough, it can get along with the early peach and some of the apples, in which to breed and feed.

The Canker worm, the Tent caterpillar, the leaf-rollers and other leaf-eating insects, find instead of an occasional wild cherry tree, wild crabapple tree or wild plum tree, whole acres of improved varieties of these, acres upon acres of raspberry and blackberry, strawberry and grape. Grass feeding insects find hundreds and thousands of acres of grassy plants, more tender and juicy than the natural grasses. Is it any wonder that native insects, before confined to a less number of less fruitful trees, with an occasional year that permitted almost no fruit at all to grow, thus almost exterminating them, should, under such favorable conditions as is offered by our present system of fruit, vegetable and grain culture, thrive and increase in numbers far beyond what they would under less artificial and less favorable surrounding? We first create an environment, unnatural and vastly more favorable than the original for the development of insect enemies of our crops, and bring about the very conditions that these insects are intended to prevent, and then wonder why it is that they do what is the most natural thing in the world for them to do, viz: Feed and breed in the midst of plenty. It has always seemed to me that the fruit grower who planted out his orchards, vineyards and berry fields, and gave them no protection from the natural enemies, was doing about what a commanding general would do if he were to send a division of his army into the enemy's country and not support it by other troops. It is as plain as can possibly be that the fruit grower must use artificial measures to fight the enemies of his crops, if he expects to succeed. The present conditions are what they are, and we cannot now change them.

This being true, it is manifestly the proper course to pursue, in seeking by artificial means to counteract, so far as possible, the adverse effects of these present conditions, and, thus the spraying of plants with insecticides and fungicides becomes imperative.

THE WEAKENING OF TREES AND PLANTS BY HYBRIDIZING,
GRAFTING, ETC.

While we have been increasing the areas of many plants far beyond what was contemplated by nature, and thus inviting attacks from the natural enemies of these plants, we have also been meddling with nature's laws in another direction.

There is not an intelligent stock breeder who does not know that, in breeding from the hard but healthy scrub up to the present day standard of excellence, as he gets away from the scrub and the mongrel, he weakens the constitution of his animals, rendering them more susceptible to disease and less capable of withstanding climatic and other changes. The scrub cow is but little subject to tuberculosis, while the havoc that this disease is making in the herds of the best blooded and most carefully bred and pampered is simply astounding. Some of us who were born and reared in this country of ours, at a time when furnaces, hot and cold water pipes, chest protectors and many other attachments to our present day domestic mechanism, were offset by houses that kept the rain and wind off but gave ample ventilation, and the nearest doctor ten to twenty miles away, know perfectly well that we grew up rugged and healthy, with seldom need of a doctor; and, then, the size of the families! The beef we got was reared like ourselves, to face the storm, and was like ourselves fed on rough but healthy food, with plenty of air and sunshine for desert. What is true of ourselves and our domestic animals is true of our fruits and vegetables and grains. We have perfected varieties and breeds up to their present standard, but at the expense of their vitality and power to resist disease and the attacks of enemies. We have deprived our fruit trees, shrubs, vines and plants of their resistability to these things; have made them more pleasing to the taste of their insect foes as well as to that of the city man and his family.

Again, we have searched the world over for fruits, plants and flowers to tickle palate and please the eye of the most fastidious, and with these we have got what we did not want, viz., the insect

foes of these plants, that devoured them in their native countries. Worse than that, we not only brought the native enemies of these plants with them, but almost invariably left the enemies of the insects behind, with the result that only have such insects spread to the native plants and overrun them, but because of their having no natural enemies here, they become the worst of all our insect foes. It looks sometimes as though if we set out to put ourselves in the hands of our enemies, we could hardly have improved upon our present course of procedure. Years ago, it became apparent that something must be done to protect us from these enemies of our crops, especially the fruits and vegetables, and we set about to find remedial and preventive measures and methods of applying them, with pretty much everything to learn.

(TO BE CONTINUED)

PROFESSION VS. OCCUPATION, AS APPLIED TO FRUIT GROWING.

BY W. A. LAWTON.

Perhaps some of you readers, especially those engaged in the culture of small fruit, have had experiences similar to mine in the sale of their product. More than once I have taken a load of berries to market and upon arrival have found "everything full," to use the expression of the dealer; cases piled upon the sidewalk, upon the counter and in the ice-box, and I have been discouraged, thinking that the growing of small fruits, especially, is largely overdone. However, upon an examination of the sample of fruit, it has been found that a large proportion of it is not above ordinary and much of it even inferior, while a strictly first-class article is conspicuous by its absence. Then I have thought of the large amount of room up at the top and how lonesome the few up there must be. Encouraged anew by this thought I have said, "I will drop the occupation and enter the profession of fruit growing; I will climb as near to the top as possible, trying to attain, at least, to a position within hailing distance of those up there." Such thoughts and experiences as these are valuable if we can carry out our good resolutions. I believe the day has gone by, if ever it existed, when fruit growing as a mere mechanical occupation, or as an appendage to

general farming operations, can bring that measure of success which includes, not only the pecuniary reward, but also the satisfaction of having benefitted mankind by the production of a high grade article, and of having been a help to the profession.

This is the day of the specialist. One has said "We fail to become great men by splitting into several small men." If we would be great in the fruit industry we must study fruit growing from the soil, up through the various processes of development until we reach the ripened fruit. We must study the characteristics of the different varieties, learn of the various influences which affect them for weal or woe, strive to shield them from the unfavorable and to aid as far as possible, the favorable conditions of environment.

It seems to me that there is a large place to be filled by the progressive fruit grower. European countries have acquired a taste for our apples, but they must have the very best.

What will our American people, for whom nothing is too good, do when Europe takes a large quantity of our best apples? Most of them will have to be content, as in the past, with eating inferior apples, unless fruit growing becomes a profession and we raise the grade of our fruit from the ordinary to something higher.

We are annually importing large quantities of foreign fruits. Why can we not, in time, improve our varieties and grow such an excellent grade of fruit that we can satisfy a portion of this appetite for foreign fruit? Professor Goff is doing a grand work in bringing our native plums into prominence, and while the ordinary grower cannot carry on a line of experimentation as they do at the stations, yet we can, with the means at command, make what we have produce in its highest excellence. Doubtless we shall have failures all along the way, but failures may become stepping stones to success. One writer has said: "Our greatest glory is not in never falling, but in rising every time we fall."

Twin Bluffs, Wis.



TWO THINGS TO BE DONE SOON.

BY A. L. HATCH.

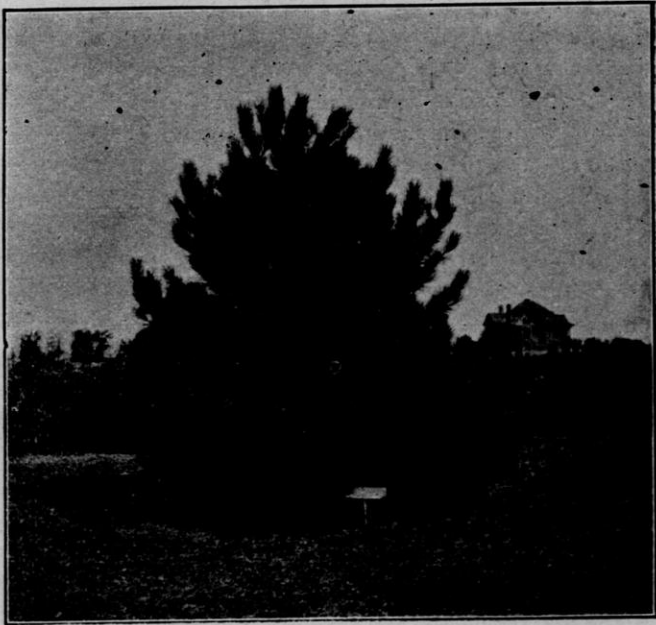
During the last half of March and the first week of April and before tree-buds swell into growth, two important tasks await the fruit-grower. These two jobs are pruning and spraying. Let no cut be made upon any fruit tree without a good reason for it. Here are some of the reasons: 1st, to check growth of over vigorous branches, those that will grow more than the average branches do, those that monopolize the growth; 2nd, to remove the under vigorous branches, those that will grow too little, that are too weak from over-bearing or other reasons to have good foliage; 3rd, to remove branches that are in the wrong places, such as water-sprouts, those forming bad forks that will split down, and branches crowding others too much.

Some don'ts should be understood here. Don't remove branches entirely from the trunk outward to make the top long and slim. Tops should be rather full and branches stocky or thick set. Don't cut off the fruit spurs; leave them to bear fruit. When a tree promises a full crop of fruit, thin the fruit by removing some of the weak bearing limbs that are full of fruit spurs. Don't let a tree over-bear, especially young trees like the Longfield and Wealthy that are prone to bear very young.

Remember that cutting off the ends of a branch tends to cause it to branch more and removal of side branches tends to lengthen the growth of that limb. Also that proper pruning tends to increase the vigor of the tree and that pruning is both directive and corrective.

Before the buds swell, the cheapest and most efficient spraying for fungus diseases of fruit trees can be done. This is cheapest because no chemical is used except blue vitriol. I have used it at the rate of one pound to 25 gallons of water but some in Michigan have used it twice as strong with good results. It is also cheaper because no foliage being present less water is needed to cover the trees in spraying. To do a good job two sprayings should be done, once when wind is in opposite direction from what it was when first spraying was done. This is to insure covering every part of the tree as there is always breeze enough to carry the mist of the spray in one direction. No fruit tree is exempt from fungus diseases and spraying is a necessity.

Sturgeon Bay, Wis.

SCOTCH OR SCOTS PINE—(*Pinus Sylvestris*).

The accompanying illustration is from a specimen on the University grounds, at Madison. This pine is fully hardy in Wisconsin. It attains a height of 75 to 100 feet at maturity in favorable situations. Branches spreading and usually pendulous; the tree assuming a pyramidal form when young, becoming irregular, less dense and straggling in old age. For these reasons the Scotch pine is not well adapted to small plantations as farm yard and city lots. On large plantations, especially on rugged hillsides, where the picturesque in landscape art is more sought than grace and symmetry of outline, the Scotch pine may be used to excellent advantage. It thrives, in common with other pines, on somewhat sandy, well drained soil and in exposed situations.

As the name implies, it is a native of Scotland and in time past the forests of Scotland furnished much of "deal" lumber, so often mentioned in English writings.

FREDERIC CRANEFIELD.

BULB CULTURE.

BY EDWIN B. SKEWES.

This paper is written in the interest of the home garden. It is not expected to add to the knowledge of the professional floriculturist, or of the experienced gardener, but to stimulate an interest on the part of the inexperienced in a large and valuable class of flowers, that are often neglected because not quite understood.

It goes without saying, that bulbous plants furnish our earliest flowers and some of the most easily grown house flowers. They are also among the most prompt to furnish color display after setting out, and the long rest period of many species permits of an after planting of foliage or flowering plants, that makes possible an extended season of bloom or color for a given spot of ground. Then, too, the small amount of root space they require, and the promptness with which they flower admirably fit them, in many of their species, for planting in nooks and corners and in unfilled angles in the shrubby or herbaceous border. These good qualities, aside from others that might be mentioned, should secure bulbous plants a prominent place in the garden plan of every home, and the subject of bulb culture is therefore of importance to every flower grower.

The difficulties to be met in growing flowers from bulbs and the similar class of tuberous-rooted plants are not serious if one has good bulbs and tubers to start with. In many species, chiefly the early flowering ones, the bulb or tuber contains within itself food for its future flower—all, or nearly all that the flower will ever get. In the later flowering species the bulb supplies the food for the establishment of the plant, and upon the bulb depends the vigor of the plant, and therefore much of its flowering capabilities.

It the bulb be full and strong—that is, well stored with food, well matured and well preserved, abundant and well formed flowers may confidently be expected, suitable conditions for growth at the flowering season being present. Fortunately such suitable conditions are easily supplied. Species vary, of course, in their habit, and one needs to know the requirements of each in regard to time of planting, depth of planting, character of soil, supply of moisture, exposure to sunlight, and protection from cold. These known, and with good bulbs to plant, successful results in flowers should follow.

He who would practice bulb culture therefore, will find his chief problem in "How to secure good bulbs." In many cases it is better and cheaper to buy from those who make a business of bulb growing, than to grow them oneself. But if one buys, he should buy only the best (not necessarily the highest priced); and if he grows them, he should grow them the very best he can. The cultural details for even the more common of the bulbous plants would be too numerous to present at this time, and it is not desirable to present them in this connection either. It would be better for him, who would grow bulbs, to get a "book of directions," for it is not so much the general methods of treatment as a considerate adaptation of surroundings to the little details of their life habits that makes bulb culture successful. Many bulb catalogues give fairly satisfactory directions for culture, and there are a few standard works on the subject, but any or all should be supplemented by notes from one's own experience.

Though cultural details are not desirable in this paper the statement of a few general principles will be permissible.

WINTER PROTECTION.

Tulips, crocuses, jonquils, and other hardy species are not materially injured by freezing, though perhaps a few species are injured by very severe cold. Repeated freezing and thawing, however, is decidedly injurious, often disastrous. Protection is therefore desirable for all bulbs in this climate. The best covering for the purpose is fallen leaves mixed with sifted coal ashes. The ashes prevent mice from harboring in the leaves and burrowing after the bulbs. This covering needs to be boxed or else held in place by coarser material, such as pine boughs or marsh hay weighted down. For the very hardy bulbs the coarser covering alone would be sufficient. Hyacinths and most lilies should not be allowed to freeze. To prevent freezing, the covering of leaves and ashes should be six or eight inches thick, and extend at least two feet beyond the margin of the area to be protected. Coverings should be removed promptly as soon as the plants begin to appear above the ground in the spring. If late frosts threaten, protect temporarily with mats or a light covering of leaves.

SHADING THE GROUND IN SUMMER.

Most bulbs require a cool, moist soil for successful flowering. For the late flowering species it is therefore well to cover the ground with lawn clippings or some such material to prevent over heating of the soil by the sun's rays.

BEDDING BULBS.

When selecting bulbs for bedding purposes one should select from named varieties, otherwise he will be likely to have different shades of the same color and confused and inharmonious combinations. Mixtures are sometimes permissible—even desirable. But there are mixtures and mixtures, some mere conglomerations of color, others a lovely blending of harmonious colors; some composed of first quality bulbs, others of inferior quality bulbs and odds and ends.

SEASONABLENESS OF PLANTING.

Snowdrops, crocuses, hyacinths and tulips are essentially spring flowering, and it will not do to delay planting them until spring. Such bulbs must be planted in the fall. Gladioli and dahlias, on the other hand, are late summer and fall flowering, and there should be no hurry to get them started in the spring. Many species can be taken up and stored in a dry place for a long time, crocuses and tulips for example. Others can bear but little exposure to drying atmosphere or remain dormant for any length of time, *Lilium candidum*, for example. These characteristics at once suggest the necessity for a different mode of treating the bulbs in regard to transplanting or sorting.

SPECIAL METHODS: BULBOUS PLANTS FROM SEEDS.

Many species are propagated readily from seed; and while few varieties "come true," uniformly good results are obtained if proper care is taken in selection of seed. Cannas and dahlias, for instance flower the first season from seed and produce even better flowers when treated as annuals, than when grown from divided tubers. Seedlings of the garden or late flowering tulips are unique in that for the first years of their blooming they have solid colors, but after from one to five years, they break into distinct types of markings and may be propagated by offsets "true to type." This

class of tulips is grown very largely from seed, the best flowered bulbs propagated by offsets before they "break," and sold under the names of selfs, mother-tulips and breeders. These selfs are perhaps, the best thing among late flowering tulips for the amateur to buy, for they produce magnificent flowers of rich solid color, and will sooner or later break into more or less beautifully marked types. It takes from two to six years for seedling tulip bulbs to attain to flowering size. As experience is gained in the handling of bulbs, other special methods will suggest themselves and thereby add to the pleasure of bulb culture.

In conclusion it may be said that bulbous plants have just as beautiful flowers, and in almost as great variety as any other class of plants. They are easily grown, but have ways of their own, and their whims must be humored before success will attend their culture.

Madison, Wis.

STRAWBERRY CULTURE ON A LARGE SCALE.

BY J. L. HERBST.

There are no new methods employed in growing strawberries in my section but what are in use in your own state. Twelve years ago there were less than ten acres of strawberries grown in the vicinity of Sparta. Five years ago there were more than 350 acres, but now there is considerable less, and the acreage is decreasing at Sparta.

The soil is made ready for the setting of the plants as soon as we are able to get onto the ground in the spring. It is made fine and mellow after plowing by the use of spading harrow and drag, and by planking if necessary. Some plantations are plowed in the fall and again in the spring, the main object being to get the soil in a fine mellow condition, so that the plants can be put in the soil in proper shape. Rows are marked off both ways where plants are set by hand, but where the transplanter is used this is not necessary.

Some prefer the transplanter to hand setting, but the majority set with spade. While it takes a little longer to set by spade, still by this method each plant is set exactly the same distance apart, and cultivations can be given both ways for awhile, which saves a good

deal of hoeing. Plants are set eighteen inches to two feet apart in the row, according to variety, and the rows are three and one-half feet apart. The slow growing varieties are set closer together in the rows, but those that are strong and vigorous are set futher apart in the row.

Some growers set two rows of pistillates and one of staminates while others prefer three of pistillates and one of staminate. A good plan is to set two pistillate and one staminate for ten or fifteen rows, and then set two pistillate and a different staminate for ten or fifteen more rows. If you are setting two or three acres of Warfield or any other pistillate, use different staminates to fertilize them, using early and late staminates. By this method you catch the early and late blossoms of the Warfields.

Just as soon as the setting is completed cultivation begins and is kept up at intervals throughout the season, narrowing up the cultivator as the runners increase, the object being to throw runners one way and make a matted row. Resetting is done, and runners thrown in vacant places to insure full rows. Cultivation is kept up until frost appears, and hoeings given as the weeds appear. What blossoms appear are nipped off at this time. The beds are given their winter protection as soon as freezing begins. This consists of marsh hay, straw or any coarse litter, spread on just thickly enough to cover the leaves. This finishes the work for the first year.

The following spring, as soon as the leaves begin to push up into the covering, it is removed to the space between the rows to serve as a protection to the fruit from becoming dirty and to act as a mulch. No cultivation is given the second year. This year comes the harvesting and disposing of the crop. I consider this the most important part of the business, and for the grower, to harvest his crop and dispose of it in the way it should be done, must know his business. There was a time when strawberries of any kind, good, poor and indifferent, could be placed upon the market in any shape and bring a good price. But that time has passed, and the grower now in order to command a good price and find ready sales must send out only fruit of good quality, size and color, put up in neat and attractive shape. Did you ever put up nice, large highly colored strawberries in dirty, broken boxes and crate. and then put the same kind of fruit

in clean and well made packages and see which sold the first and brought the highest price? Growers at Sparta have found this out and never use boxes the second time.

There are different methods used by which the crop is harvested but I shall give you the one I am best acquainted with. The pickers are mostly women and girls. Boys are too talkative and get lame in the back too quick. Pickers must agree to stay throughout the picking season or forfeit a quarter of a cent on each box picked. In other words they are paid one and one-fourth cents per quart for picking, and if they have been faithful and remained throughout the season they are paid the other one-fourth of a cent at the end of the season. Each picker is numbered and holds this number throughout the season; the crate she picks in has the same number, so that wherever you find number "27" crate the picker of it is also number "27." One reason for this system is this. A tender gets her crate, gives her a check for it, and brings it to one of the tables, that stands in the field. At each table is a girl whose business it is to put the fruit in crates, and to see that all berries are picked properly and boxes filled. If, in doing this, she finds No. "27's" berries are too green or mashed, or boxes not filled (of course we never get them too full), this is reported to the foreman of the pickers, and as he has a list of all pickers and their number he is able to know just who it is and can remedy the trouble.

Pickers are not allowed to carry on unnecessary conversations; tenders are not allowed to converse with pickers—the foreman does all talking.

As soon as the berries are crated they are hauled to the packing shed, where, after another party has inspected them, they are covered and taken to the shipping point, either to express or refrigerator cars, as the case may be. A grower who knows his business will get his fruit on the way to its destination as soon as possible after being picked.

Those, who intend to do any spring setting of fruit trees, shrubbery or small fruits should send in their order early to the firm from which they buy. As a rule the best stock is sent out first and late customers get the cull stock.

COVER CROPS FOR OUR NURSERIES AND ORCHARDS.

BY M. S. KELLOGG, JANESVILLE.

The discussion of this topic is of vital importance to all those who grow fruit, either for commercial purposes or for home consumption, for to do so they need Wisconsin grown trees to start with, if they are to succeed in the highest degree. The extremely severe winter of 1898-9 made it very apparent that the commercial tree grower must take some other measures for protecting his young growing stock than by depending on bodies of snow, or else must suffer loss occasionally by winter root-killing. All of our growing stock of fruit trees at Janesville was either killed outright by the severe winter referred to, or was so badly injured that it never fully recovered.

The following fall, when the ground froze sufficiently to bear a team and wagon, we began mulching our one-year old grafts with stable manure, and in doing so, I believe, we saved them, although they were somewhat injured, since that we have endeavored to secure the protection necessary through growing some cover crop. In this work we have used such crops as buckwheat, field peas, buckwheat and peas together, rye, millet, rye and millet together. Sand or winter vetch in combination with millet and rye, and oats. Of the foregoing we have grown the best covers with the sand vetch and with rye.

During the summer of 1900 in a plantation of one-year old grafts we sowed sand vetch and secured a good catch, it made a good growth, and aside from two objections, is the best cover we have used. The first objection is that you are not always sure of a stand, as we have since sown vetch and got left, and then put in rye and got a good growth before winter. The second objection is the tendency of the vetch to climb the young trees and pull them over deforming them for all time. The seed is also high priced. The same summer we used peas and buckwheat in two-year old plantations, supplemented with stable manure. This two-year old block of trees was prairie loam soil sloping to the south and east, one side of which is rather light soil inclined to be gravelly. From this block of trees we dug and placed in our cellars last fall about ten thousand trees and fully one-half of the block is still standing.

Next in value to vetch, we name rye; it is cheap seed, easily

grown, you are almost always sure of a good stand, grows late in the fall and we have found it a good cover crop. However, we may know more about it in six months as we have several acres of it in our young trees and it is by far the heaviest growth we have ever had. Seed was used at the rate of about four bushels per acre and it has made a fine growth, being 8 to 10 inches high, and now as it mats down on the ground proves a very decided cover. One thing, however, must not be lost sight of in using rye as a cover crop either in the nurseries or in the orchards and that is, that it must be cultivated out before it makes much of any growth in the spring or it will take more out of the soil than it returns. This may be a good way to spur the careless nurseryman or orchardist (but of course there are none such at this meeting) to cultivate his trees early.

The cover crops for the orchard should be sown from the 10th to the last of July. Those for the nursery we have practiced sowing from July 20th to Aug. 15th to 20th. In either instance the weather will govern the exact date of sowing. In sowing the cover crops in our nurseries we have used a hand seeder and followed the cultivator and in turn have followed the seeder with a planker to smooth the rows and pack the soil on the seed.

That we must grow cover crops goes without any argument, but, just what crop we shall grow is still an unsettled question. Prof. Taft, of Michigan, believes oats to be the best cover crop for the orchard, but that does not necessarily mean the best for the nursery, for the orchard crop is intended for a mulch in the spring, and must be a crop that does not grow rampant early in the season, while the nursery cover crop is turned under as soon as the cultivator is started, and should add fertility to the soil.

In selecting a cover crop, we should consider the following points: We must have a crop that grows quickly; one which is reasonably sure to catch, one year with another; one that the seed is not expensive, and if possible one which will add something to the soil which will aid tree growth. As these crops are sown in a usually dry season of the year the clovers are not to be considered very seriously as they are uncertain of germination and slow of growth. Above all, whether in orchard or nursery, cultivate the

crop under early and then cultivate, cultivate, cultivate, retain all the moisture possible with a dust mulch and aid in avoiding drouth.

In closing would say, do not depend on any one crop, have two strings to your bow and if one fails use the other till the first one is repaired. There is no one crop which will uniformly succeed, and each one will need to do some experimenting for himself to determine just what is best for his needs. The experiment stations in the different states are doing work along this line and we must look to them to tell us what crop is going to add the needed humus and tree growing matter to our very diversified soil; the average nurseryman and orchardist has not the facilities nor the time to experiment to determine what is lacking in his soil.

THE PRUNER'S PROBLEM.

BY PROF. E. S. GOFF.

During the summer of 1898, we had a good apple crop in Wisconsin. There was one orchard that I visited, of which the trees were nearly all well loaded, and the crop was very large, but the trees in this orchard were old, and the fruit on most all of them was undersized. It was a good crop for this orchard. Across the road from this orchard was a young orchard that had been planted about eight years, I think. The first orchard that I spoke of had been well taken care of for ten years; it had been sprayed annually from one to three times; the trees had been pruned every year, the ground had been cultivated a portion of the time and had been manured to some extent. The young orchard on the other side of the street had been neglected. The ground was in grass; the trees had been sprayed some, but had been only partially pruned. The trees evidently had not made a very rapid growth. The apples in this young orchard were very fine indeed; I think I never saw such a fine collection of apples, on the whole, as I saw in this orchard. When these apples were sent to market, they sold for about a dollar a barrel more than those from the old orchard that had been well taken care of. The question occurred to my mind at that time,

why those young trees, that had been poorly taken care of, yielded so much better apples than the old trees that had been well taken care of? That question has been with me more or less ever since. Of course it is a very easy way to dispose of it by saying that young trees are thrifty and vigorous, and, therefore, yield the better apples, but that answer does not satisfy me. An apple tree is not like an animal in all respects; an apple tree is in one sense, a colony rather than individual. To illustrate what I mean, we can take any bud off from an apple tree and insert it in another place, and if the operation is successful, the bud will grow just as well. We can cut off a hundred buds and another hundred buds will grow on again. We can take a portion of the wood from a young apple tree that is vigorous and we can graft it on an old tree that is not vigorous, and the graft will be feeble like the old tree. In an animal, on the other hand, we cannot duplicate parts. If we take a part off from the animal, the animal is short just that much. We cannot inter-graft; we cannot reproduce parts to any large extent. To say that the same law applies with plants as with animals, I do not want to accept fully. I think we should be able to explain on physical principles the reason why a young apple tree bears larger fruit than an old apple tree and that is what I have been trying to do. Before I begin this explanation I want to spend a moment in explaining the growth habit of a tree.

In the first place, we have the root system which absorbs water from the ground and transmits it to the trunk. The roots have an absorbent system of their own and their nature is to draw in water with more or less vigor. Then when the water is taken to the trunk, the fibres of the trunk tend to lift the water by capillarity, and the buds above are filled with protoplasm which has an affinity for water, and so we have a force that draws the water from the roots into the top. It is a principle well known in physics that water will pass with more force through a straight tube than it will through a crooked tube, and that every bend we make in the tube reduces the force to some extent. It follows that the buds of an apple tree, or of any other tree, that are in the most direct communication with the axis of growth, are the ones that will receive the most water. Every time a branch grows that branch does not receive quite as

much water as the stem from which it grew, and if that branch subdivides, the secondary branch receives less than the primary branch, and so on; the more it branches, the less water it receives, and the less vigor it has and the less it grows; it is this principle that determines the form of the tree. You know, as the tree tends to grow upright, the terminal buds receive more water than any other buds, because they are in the most direct line with the source of water; every branch that grows loses somewhat in vigor. By and by, when the tree attains a height so great that the distance from the roots over balances the fact that the terminal buds are in direct communication with the axis of growth, the uppermost branches will no longer dominate, and the tree will come to an equilibrium; the branches will grow just as much as the terminal shoots, and we will have a full-grown, developed tree. It will continue in this way for a certain number of years and finally the distance from the roots tips to the terminal buds, and the number of branches will be so great that the life forces are no longer able to carry up the water with sufficient force to cause growth, the tree will stop growing and will by and by begin to fail. (The speaker here showed specimens of fruiting branches of the apple tree).

I have here a portion of the tree that grew last summer. The buds are small and flat and close to the wood; the terminal bud is the largest and strongest. If we go back one year, we find that buds that began to grow out, have received water enough to start a new growth. At the beginning of the season, the whole tree was full of water; the roots had been pumping in water gradually all winter, there had been no leaves to evaporate the water, and so the tree was stocked with water, and when growth opened in the spring, all the buds were started into growth. Pretty soon the terminal buds, being in most direct communication with the branch, got the start of the others, and took almost all the water. so the lateral branches grew out about an inch and then stopped. That was what occurred during the season before last. Now, if we examine the growth of the season before that, we find there was a similar short growth that started in the spring, but we will notice also that there are certain scars which, if we are acquainted with the history of the tree, we know to be where flowers opened. In other words, the part which grew in the summer of 1899, had flower-buds in the season of

1900, and those flower-buds opened in the spring of 1901, and having opened, they either dropped off, or made a fruit, and the twig ceased to grow at that point. When a flower opens, that is the end of the life of that bud, it may form a fruit, if it does, the fruit will mature and drop off, but that will be the end of that growing point. That is true of all buds. But when these flowers opened, no more growth could occur in that line, therefore the force of the tree was exercised into some of the smaller buds beneath, and we had branch buds starting out. If we go down a year further, on the branch, we find that there are two places on each of these spurs where the flowers have opened. In other words, these spurs have blossomed twice. We might go on down the stem if it were longer, and we should find that every time the spur blossoms it makes a new series of branches, for the reason that the growth stops when ever the bud blossoms. By and by we will come to a condition something like this (showing specimen) in old trees. This you will recognize as an old fruit spur. We will find that these have blossomed six or eight times, which shows that this spur must be six or eight years old at least, and in some years they do not blossom at all, and then of course we simply lose a year.

The point that I wish to make is this: Every time the stem branches, the bud on that branch is a little less vigorous. The sap will not pass through a bend as readily as it will through a straight line, because the water moves along the lines of the least resistance. It follows that every time the fruit spur flowers and branches, it will receive less water than it did before, and consequently the fruit that is borne on that spur will be smaller, because the size of the fruit depends largely on the amount of water it receives. Now, if my reasoning is correct so far, the conclusion is, that the older the fruit spurs, the smaller will be the fruit, and I believe this to be true as the result of my observation. This explains the fact that the fruit on all trees is small. The pruner's problem that I started out with is this: How can we make old trees bear as fine fruit as young trees? Until we can do that, we have not mastered the subject. The demand at present is for large, fine fruit.

(TO BE CONTINUED)

HOW TO CARE FOR THE ORCHARD.

BY EDWIN NYE, APPLETON.

I would first plant my orchard. I would plant the very best young healthy trees I could get, and of the very best varieties. I would have my ground in as good condition as I would if I wished to raised a premium crop of any kind. Then, I would plant my trees carefully, cutting away all bruised and broken roots, and superfluous tops. I would set them in straight rows and at proper distances apart. I would mulch the ground around the trees and plant corn, beans, or other hard crops between; I would hoe and cultivate thoroughly, keeping the ground mellow and the weeds under. I would watch and work from day to day; if a bud or twig appeared, where I did not want it to grow, I would pinch or cut it off. If a worm or insect came to prey upon, or eat my trees, I would kill the worm and crush the insect. If an unruly steer got in, or from any other cause a tree got wounded or bruised, I would carefully cut away the broken or wounded part, painting it over with liquid shellac to exclude the air, giving the tree a chance to start again. I would keep the steer out after that. If a rabbit, or mouse, came to injure or gnaw my trees, I would kill the rabbit and the mouse.

I would keep up this watch and care and cultivation year after year. I would keep the soil in good condition by the use of fertilizers, and also by plowing down clover and other green crops. As the trees got larger, I would occasionally pasture these crops with sheep, or swine, watching carefully that they did no injury. As the trees grew and came to bearing age, I would double my diligence to kill every injurious insect, or worm. I would cut out every dead or superfluous branch, every blighted twig. I would watch for fruit, bud and blossom, and for the growing and ripening fruit, and as it began to color and ripen I would invite my wife and friends to taste and admire it. And now this fruit is carefully gathered and stored in the cellar, it may be that you will find a barrel or kegs of cider store there also.

Then imagine this man, who has labored and watched and waited all these years, seated a winter evening with his family and friends, around the hearth before an open wood-fire. It may be the

fire is made from the dead body and branches of an old apple tree. There is a mug of cider on the stand, also a large pan of apples. Think of this man's feelings if he has nothing better to set before his friends than the hardy "Iron Clads" of the Northwest.

Let us raise more apples good to eat and fewer for show.

RESOLUTIONS PASSED AT THE WINTER MEETING, FEB. 1902.

Resolved, That while we are grateful for the cordial relations existing between our Society and our State Experiment Station, we feel that neither our Society as a whole, nor its individual members, have shown sufficient interest in the work of the station, nor have they expressed their wishes as to the policy of the Horticultural department as freely as should be done. Therefore, we request that our Experiment Station shall give more attention to the suppression of insects, pests and plant diseases, to the extent that our orchardist's may receive from the station such assistance and advice in combatting these pests as is given in other states.

We urge that an experimental orchard be established on the station grounds, or at some point near Madison, under the direct supervision of our State Horticulturist for the purpose of testing the hardiness and other qualities of the many promising seedlings now coming to our notice.

We heartily appreciate the work which has been done at the station in testing the adaptation of various kinds of ornamental trees and plants, and we ask that our State Horticulturist be given greatly increased facilities for carrying on the same work.

Whereas, the Wisconsin State Horticultural Society has become a great factor in the industrial progress of the State, and we believe that we should receive recognition commensurate with our work.

Resolved, By this Society that the Governor be requested to set apart a suitable room in the capitol building to be designated as a permanent home of this Society.

Whereas, The Wisconsin State Horticultural Society has received many benefits through the eminent Horticultural abilities of H. E. Van Deman, not only in connection with our exhibit at the Pan American Exposition, but also in planning for the same and at other times.

Resolved, That we ask the Louisiana Purchase Exposition Commission to make use of his valuable services in promoting the Horticultural interests of the Exposition.

Resolved, By the executive board that the Wisconsin State Horticultural Society recommend that an exhibit of fruits be made at the Louisiana Purchase Exposition providing sufficient encouragement and funds be awarded the society by the Wisconsin State Commission.

Further be it resolved, That the executive committee be requested to ask for not less than \$2,500 for the purpose of making said exhibit.

Resolved, That all ex-presidents and ex-secretaries of our Society be made honorary life members.

Resolved, That in consideration of the valuable aid and encouragement given to the Wisconsin Horticultural Society by Andrew Kreutzer and Daniel E. Riordan, that it be the sense of this meeting, that they be elected honorary life members of this Society.

Whereas, It has been deemed advisable to amend the constitution and by-laws to conform to the present conditions,

Be it resolved, That the president be empowered to appoint a committee of three members of this Society to make such changes as may serve the best interests of our Society and report at the next annual meeting.

Resolved, That the members of the Wisconsin Commission to the Pan American Exposition, including Secretary Hambright, be

made honorary life members of the Wisconsin State Horticultural Society.

Resolved, That the State Horticultural Society send the greetings of the members in Annual Meeting assembled, to our honored and beloved members, J. S. Stickney, A. G. Tuttle, F. S. Phoenix and F. C. Curtis, and kindly inform them of the regret expressed by each and all at their inability to meet with us.

Resolved, That we make Mrs. B. S. Hoxie an honorary life member of the Society.

EDITOR'S NOTES.

Edwin Nye of Appleton, places quality before hardiness of the apple, for the home orchard.

Irving C. Smith attended the State Meeting of the Michigan Horticultural Society as a delegate and his report will come in later.

Invitations have been received from the Waupaca County and Baraboo Horticultural Societies to hold the next Summer Meeting in their cities.

Three applications have been received, all from Dunn county, for one of the new trial orchards to be established this coming spring by the Society.

The following resolution was adopted by the Society at the last annual meeting: That it is the sense of this meeting, that we as a society, do not favor the summer or fall setting of strawberries.

The Waupaca County Horticultural Society, which formerly had standing and location in Weyauwega, but not reported as existing in the State Society, has been merged with the Society at Waupaca, and hereafter the two Societies will go as the Waupaca County Horticultural Society.

If an orchard has had careful pruning from the start, it does not need any great amount of pruning at any one time. If the trees have become a good size and not properly pruned, take out the limbs that require it most and leave some for another year. Do not give the tree too severe a cutting at one time.

The State Horticultural Society has had a good deal of recognition of late. President Loope gave an interesting talk on Horticulture at the Annual Round Up of Farmers Institutes, at Oconomowoc, and the Secretary, J. L. Herbst, has been appointed by the Governor, a member of the State Board of Agriculture from the seventh district.

President Loope and members of the committee appointed to meet the State Commission and secure an appropriation for the Society to make an exhibit of fruit at the Louisiana Purchase Exposition went before them and while nothing definitely was done they were met with a very favorable reception and we expect to hear something definite in the near future.

In the propagation of various strains of fruit, use scions and buds from trees in bearing and not from the nursery row. G. J. Kellogg says: "There is a certain difference between Duchess, a certain difference between Wealthy. Now are we propagating from trees that we know are a success? I believe that the fruit of a young tree propagated from a bearing tree of vigor and productiveness is worth four times as much as one where the scions are taken from the nursery row."

FROST PROOF STRAWBERRIES.—Reporting on a series of experiments conducted to ascertain the comparative frost resisting properties of different varieties of strawberries, the Montana experiment says: "In the varieties which were most damaged by frost the seeds were most exposed to the surface; in the varieties that suffered least the seeds were least exposed; and the gradations of seed exposure and consequent injury were plainly marked. "Nine varieties of strawberries experimented with, the Bissel, Crescent, General Putnam, Princeton Chief, Parker Earle, Robinson, Stevens, Shuster Gem and Warfield, all of which have the seeds deeply embedded in the pulp, escaped injury altogether. Varieties with short fruit stalks

and long leaf stalks, it is also noted incidentally, are less liable to injury from late spring frosts, from the fact that their flowers are to some extent protected by the foliage."—*Minnesota Horticulturist*.

REPORT OF THE WAUPACA COUNTY HORTICULTURAL SOCIETY.

Our Society consists of about twenty-five families. We hold meetings in both city and country places, usually collecting from 50 to 250 people at a meeting. We collect 25 cents annual dues from the head of each family. We usually have picnic suppers and always have an interesting program. Usually hold a winter fair and pay small premiums on fruits and vegetables. We do not hold regular stated meetings, but arrange to meet at convenient time and place. Our Society is doing much good in the way of encouraging the cultivation of fruits, flowers and plants, and encouraging the younger members of the families to read and talk in public.

We have elected the following officers for the ensuing year:

President, A. D. BARNES, Waupaca.
 Vice-President, MRS. ROBT. POPE, Lind.
 " " P. A. HAM, Crystal Lake.
 " " HOLLIS GIBSON, Lind.
 Secretary, W. H. HOLMES, Waupaca.
 Treasurer, M. R. BALDWIN, Waupaca.

REPORT OF GRAND CHUTE HORTICULTURAL SOCIETY, APPLETON.

Our Society is hold' its own in regard to interest and membership. Total membership is 65. We hold four regular meetings each year. Our members feel that it would be a matter of much interest to our meetings, if an officer of the State Society would occasionally visit us. The Officers are:

President, C. A. ABBOTT.
 Vice-President, WALLACE ROBLEE.
 Secretary, MRS. JOHN FINKLE.
 Treasurer, J. P. BUCK.

IN MEMORIAM.

F. C. Curtis, died Feb. 8, 1902 at Lowville, Wis. in his 83d year. He was born in Stockbridge, Mass. September, 3, 1819 and was consequently well advanced in years at the time of his demise. Up to within a few days of his final illness he was in good health and as cheery spirits as ever, but on Saturday, Feb. 8, he joined the great majority.

Mr. A. J. Philips of West Salem, has the following to say of Mr Curtis:

"The Wisconsin State Horticultural Society was organized on the evening of September, 28, 1864, with the late F. C. Curtis as chairman. Of the first Vice-Presidents, G. J. Kellogg, J. S. Stickney, A. G. Tuttle, and Henry Floyd are still living. Mr Curtis acted as chairman at the two first meetings of the society; and at the third meeting in September 1864 was elected its first treasurer. Mr. Curtis wrote me in January last, that his election at that time was owing to the love of apples that he brought with him from the east, and planted in his new home in Columbia county. He also said he would, if his health permitted, attend our annual meeting in Madison in February and tell us something of the society's early work. But on Thursday evening of our meeting I received a short letter from him saying he was feeling so badly that he could not come. I have good reason to believe that this was the last letter that he penned as he died just two days later, February 8th, 1902."

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to be given to the one sending in the largest number of yearly subscribers to the WISCONSIN HORTICULTURIST. This offer holds good until the 1st of June, 1902, and is offered to members only of the Wisconsin State Horticultural Society. Remember the subscription to the HORTICULTURIST is 50c per annum, but in clubs of five, 40c. Send in your subscriptions as you get them and receive credit. The only paper printed in the State devoted exclusively to the culture of fruits, flowers and plants. Many new features for the coming year.

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
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