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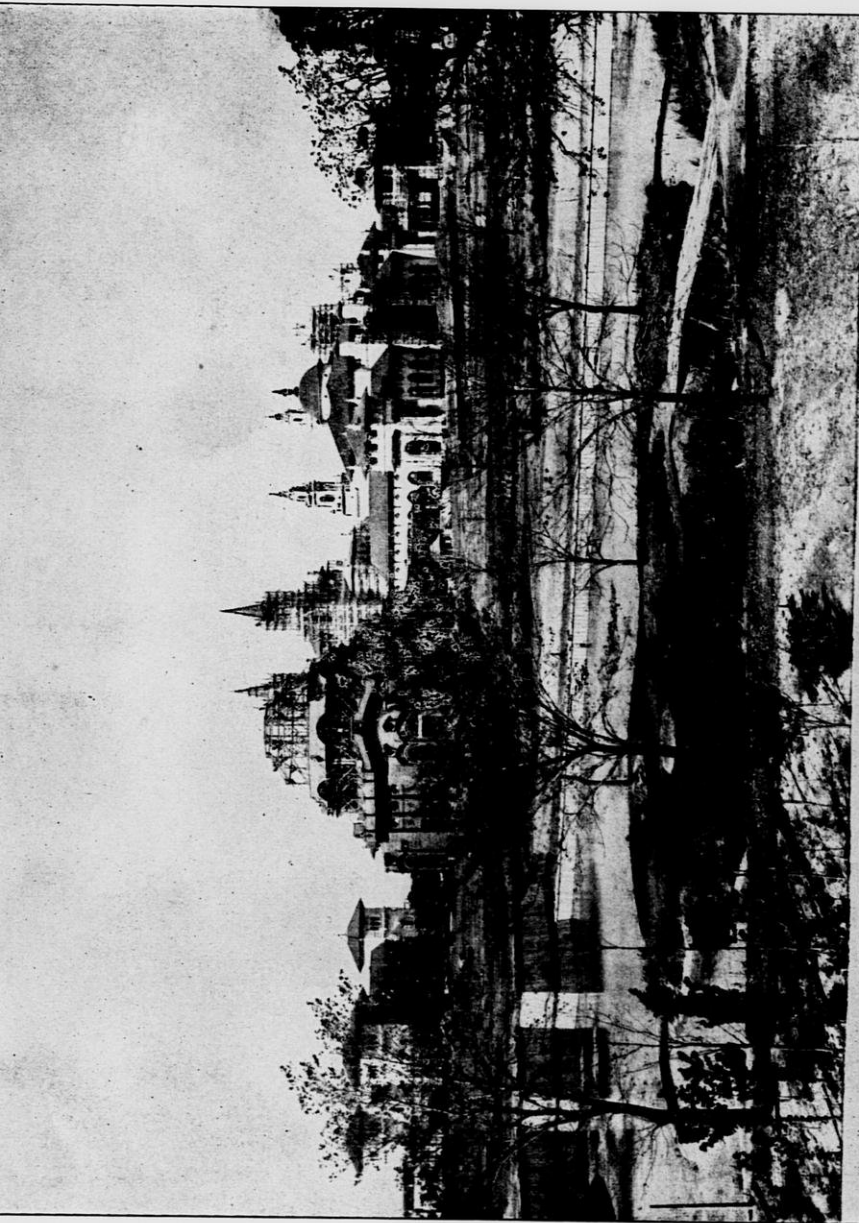
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PAN-AMERICAN EXPOSITION.
VIEW FROM SOUTH, SHOWING WATER GARDENS IN FOREGROUND, GRAPHIC ARTS BUILDING AT THE LEFT, TEMPLE OF MUSIC IN CENTER AND MACHINERY BUILDING BEYOND

The Wisconsin Horticulturist.

VOL. V.

DECEMBER.

NO. 10

OFFICERS OF THE STATE HORTICULTURAL SOCIETY FOR
1900.

President, Franklin Johnson, Baraboo.

Vice-president, Dr. T. E. Loope, Eureka.

Secretary, John L. Herbst, Sparta.

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CHRISTMAS.

"The old festival began on December 16 and lasted until Twelfth Day, January 6. It was made memorable to every peasant and beggar in the land by the profusion of good things to eat and to drink. The starving beggar who had strength to survive until this good season could renew his chance of life in this time of plenty. When the yule log burned old wrongs were righted, old feuds forgiven, and in the warmth of its cheerful blaze the heart was quickened to deeds of kindness.

Now we keep Christmas all the year. We feed the hungry every day in the year. If there is less sentiment in our

charity there is more system. It is considered a disgrace to any community for any person to die of hunger. In the days of old Christmas, persons frequently died of starvation. Whole communities were half-fed part of the time, to be feasted occasionally. The monasteries were almost the only refuges for the sick or unfortunate.

Let us all be thankful that every one is so well fed and so well warmed in these later days that no one desires to celebrate Christmas because of extra food or extra fill. Let the Christmas bells ringing across the snow

‘Ring in the nobler modes of life,
With sweeter manners, purer laws.’”



CULTURE OF PLANTS IN THE SITTING-ROOM WINDOW.

To guard against the cold is an all-important consideration. When the wind whistles around your dwelling, seeking for an entrance through some opening, you may be sure it will gain that entrance, if possible. Plants are much more liable to freeze on a windy night than on a still one, though the temperature may be much lower on the still night. If you place a newspaper between the window and the curtain, and fit it nicely to the casing, it will check its course and protect the plants. Paper bags, such as the grocers use, are useful to draw down over your choice plants that are not too large. Paste the two edges of a newspaper together and draw it over your large ones. Two or more papers can be pasted together at the edges, making a long strip, which may be pinned around a whole stand of plants. Then by placing another paper over the top you have them all nicely inclosed. This method of inclosure serves a double purpose—one to keep out the cold, another to arrest the moisture as it escapes by evaporation from the soil in the pots, and give it back to the leaves of the plants. If

your plants should be on the shady side of the house, avoid as much as possible too great artificial heat. The higher the temperature, the more the plants suffer for want of light.

CUT BACK.—To make handsome, well-shaped specimens of your Geraniums, Pelargoniums, Fuchsias and other similar plants, severe cutting back is necessary. Geraniums, to make bushy plants for your flower garden another summer, should have all the branches cut off even, or nearly so. The center ones may be left a little taller, if you choose. In a short time new branches, and many more of them than were cut away, will appear, making a well-formed plant. When one considers the greater number of flowers to be obtained from a bushy plant than from one with but a single stem, she need not spare the knife.

Some of the fuchsias are inclined to throw long and crooked branches. By pinching the end from every branch at its third or fourth joint until the blossom-buds appear, you will have a fine bushy-formed plant and many more flowers.

After pruning, the plants may be set one side and not have much water given them. But when the new leaves start, give it them freely. The growth of the plants being temporarily checked by the cutting back, the roots cannot take up so much water as when they are growing rapidly.

INSECTS.—The heated atmosphere of your rooms is just suited to the wants of the red spider. It delights in the heat, and the dryer it is the more it flourishes, and consequently the more the plants suffer.

Unless you are acquainted with their habits, you will hardly mistrust that you are harboring them at all. They are found like a tiny red speck on the under side of the

leaves. It is wonderful what an amount of mischief such little things can do.

To rid your plants of them, they should be taken to the sink or some place where water can be used freely. Place the plant on its side in the sink, and pour water upon it, turning it over and over, as you pour the water upon the leaves. Use the plant as roughly as you can without breaking it, and keep it wet as long as possible. At night you may lay it on its side on a wet cloth, and roll it up in it, letting it lie so all night. Water is the red spider's greatest enemy, and if you persevere, your plants may be well rid of it. Taking the plants to the sink once a week and showering them will act as a preventive.

The aphid, or green fly, is larger and more easily seen than the spider. Take some tobacco, put it in some water and let it soak until it looks like strong tea. The proportions may be about one-fourth of a pound of tobacco to three or four quarts of water. This may be applied with a syringe. A brush or a sponge may be dipped into the tobacco water and used to brush them off. Small plants can be plunged into it, the top downward.

The scale must be picked or scraped off, and the leaves, stems, and branches that have been infested with it washed in soap and water. These will be found more frequently on Ivies, Oleanders, and other hard wooded plants.

The mealy bug is not so common as the above-mentioned, but let it once get a foothold, and it is very difficult to get rid of it. It must be sought for diligently, and removed by washing and hand-picking.

WATERING.—It is well to give a good quantity of water, when you water your plants, that it may penetrate to the roots throughout the pot. Then do not water again until the surface soil begins to look dry. Some plants require watering much oftener than others.—Exchange.

THE SUMMER IN MY GARDEN.

The garden was platted four years ago. It contains 32 square rods, of which 12 rods are planted to plum, cherry and other tree fruits, between which, for the present, are growing bush fruits. The location is not in all respects an ideal one, as it slopes to the northwest, and the soil, being devoid of sand, is sticky when wet and inclined to bake when dry. It was part of an old pasture, so was quite free from weeds and none are allowed to grow and produce seed. It is "swamped" with rotted manure every year.

The berry bushes and the asparagus bed are in their prime. In planting the asparagus bed roots were selected from plants that bore no seed. The variety is Connover's. No garden is complete without an asparagus bed.

A cold-frame was used to prepare plants for early setting. Old berry boxes placed in the cold-frame were used to start melons. Plants so started ripened melons a week earlier than those from seed planted in the open ground. The early part of the season was dry causing trouble to get seeds to germinate. Artificial wetting was resorted to with success.

The strawberry crop suffered much from the lack of rain but after all, there was a bountiful supply. The bed contains eight varieties. Warfield stands at the head, Berderwood next. Other varieties prolong the season. Wood can stand up and make a brave fight against drought. Enhance stands third in the list. The supply of strawberries lasted thirty days.

The early pea crop was not a success. It was too dry and I am inclined to think the soil can be too rich for peas. Early Crosby, Metropolitan and Old Colony, two plantings of each, gave a succession of sweet corn. Metropolitan

has no special merit over Crosby except it has larger ears and thicker husks. It is about two days later.

In what an age of good things we live. I can remember when the table was supplied with green corn from the corn lot. One of the best dishes made with sweet corn is in combination with Lima beans, "succotash." To be just right it should be seasoned with a piece of salt pork.

Good success was had with Lima beans. Early Jersey and a variety lately introduced by Ferry (name forgotten) are both good. Henderson's novelty, Early Leviathan, was not as good as the two just mentioned. We do not care for the bush Limas. Most of them are poor substitutes for the pole varieties. The only trouble I have in growing Lima beans is to teach the young vines to climb the poles. The first beans were picked August 13th; the first sweet corn July 25th. The first ripe tomatoes were picked July 31st. The tomatoes were set 2 feet 10 inches apart in a row and trained to a trellis 5 feet high. The fruit is very fine grown in this way and the vines give a tidier look to the garden.

It was near the middle of October when the first frost appeared. The season was right for a good melon crop, both for quantity and quality. In melon time I never envy the tropical fruit grower. Emerald Gem holds the first place, Paul Rose a close second. Hackensack lacked quality. Sweet Siberian watermelon was fine. This is a small early melon with cream colored flesh. It makes a beautiful appearance when cut for the table. The first watermelon was picked August 12th, muskmelon August 14th. The season lasted until Sept. 20th.

Of cabbage, Early Jersey Wakefield was excellent. Currie's Long Keeping is well named. It is the only cabbage we have succeeded in keeping through the winter.

De Soto and Wyant plums were a bountiful crop. When

the fruit was half grown it was thinned. The number taken from one tree (fourth year from setting) was counted and found to be over 1100. There was still enough left when matured to break the tree. The Wyant is a fine plum for eating while the De Soto is best for cooking. We have no further use for the Rockford plum.

Of the bush fruits the gooseberry and currant fruited most abundantly. The Ohio blackcap is a fraud, at least what we got for that variety proved so.

In addition to supplying a small family, there was sold from the products of the garden for cash \$13.93; value of products given away \$5.15. The pleasure received from planting, cultivating, watching the growth and gathering the fruits cannot be told in figures.

But what shall I say of the birds? If those people who are afraid our birds will become extinct could have seen the flocks of robins in my garden last summer they would stop worrying on that score. It is said that birds return every spring to their old haunts. If our robins all set up house-keeping in the near-by grove next summer I shall arrange to buy our supply of currants and raspberries.

GEO. C. HILL.

Rosendale, Wis.

AMERICAN LEMONS.

The annual consumption of lemons in the United States amounts to about 5,000,000 boxes. In 1896, Italy and Spain supplied us with 4,700,000 boxes of lemons, and 300,000 boxes were grown in California. Last year there were imported from Mediterranean countries 3,800,000 boxes of lemons, and 1,200,000 boxes of the fruit came from the Pacific Coast.

NATIVE PLUMS AT THE WISCONSIN EXPERIMENT STATION.

Like many others who attended the Wisconsin State Fair last fall, I was very much interested in the exhibit of plums grown at the Wisconsin Experiment Station under the direction of Prof. E. S. Goff. The possibilities of what may be attained through good cultivation of the best named varieties of our native plums was a revelation and an encouragement that will be a great incentive to increased production of this popular fruit.

But interest was centered in the fine show of seedlings raised by Prof. Goff and when we see such marked improvement over the parent varieties in but one remove, we can't help wondering what point of excellence our native plums may yet attain to. When the supply anywhere near equals the demand which will be created by placing such plums on the market we hope the consumers may appreciate what Prof. Goff is doing for them as much as they will appreciate the fruit.

I was much surprised in Milwaukee to learn how much demand there was for even fairly good common wild plums, such as would find no place beside the better varieties which the professor is endeavoring to make popular with the growers. When these efforts result in satisfying the demand the day will have been so much hastened by the workers of our Experiment Station that we may credit them with having as good as introduced a new fruit to the people of Wisconsin.

We need not compare our native plums with the Domestic varieties. Some of the varieties of foreign plums can be grown here with satisfaction to amateurs, in quantity sufficient to give pleasure if not profit.

Wishing to see all I could of the seedling plums I stopped off at Madison and fortunately Prof. Goff was able to spare time to show the orchard with more promising

kinds which were too late to be shown at the State Fair. Some were by that time sufficiently ripe to convince one that there will be in this collection of seedlings choice varieties enough to keep up an uninterrupted succession as long as the plum season can possibly last.

And there are many trees of that brood which have not yet fruited with other years' planting to follow, so we can not but think that in a few years, more work will have been done at our Experiment Station in direct improvement of the native plum than anywhere else in the United States.

But plums and plum trees were not all that was to be seen of interest to the horticulturist. Many varieties of ornamental shrubs and trees are on trial here and I was glad to be shown around among the extensive collection of young trees, deciduous and evergreen. I hope some time the professor may have leisure to tell us of the best hardy shrubs as well as those which are worthy of protection.

An account of the improvement in the Crandall Currant was very interesting and this fruit should soon find a place in our home gardens, although it may be some time before consumers learn its value.

Improvement of our native black cherry is distinct enough to give encouragement for further effort.

To speak in detail of the outside work would take too much space in the Horticulturist, but I wish they could afford to devote more time and land to this work at the Experiment Station.

WILLIAM TOOLE.

Baraboo, Wis.



"Some folks," said Uncle Eben, "seems to think dey is havin' an ahgument, when 'tain' nuffin' but a hollerin' match."—Washington Star.

PRUNING GRAPEVINES.

The golden mean in pruning commercial vineyards lies in leaving just the right proportion of new wood to secure the proper balance between fruit and wood. If too many canes are left there will be a too great setting of fruit, and too small growth of wood. If too few canes are left there will be too excessive wood growth and too little fruit. The rule is the more vigorous the natural growth of the vine the more canes can be put up. If for example, where a vine has sufficient vigor to allow five canes of seven buds each to be put up only one cane should be put up. The result would be an excessive wood growth of this one cane to the injury of the fruit. If in the same case where five canes would be about right, fifteen were put up the result would be an excessive setting of fruit, and a very feeble growth of wood. Some pruners by long practice become very expert in determining the right amount to leave in each individual vine.—Fruit.



HOW TO KEEP AWAY RODENTS.

To protect fruit trees from mice and rabbits, remove all rubbish from about the trees as well as from the orchard. Rabbits congregate in such places. Clean cultivation is the best remedy. Before the ground freezes, make a mound of earth a foot high around the trunk of each tree. Young nursery stock may be wrapped with closely meshed wire screening. Blood or rancid grease is offensive to vermin, but is easily washed off by rains, so needs to be replaced several times during winter.—Horticulturist James Troop, Indiana Experiment Station.



Never feed fowls sulphur in damp, foggy or rainy weather.

ORIGIN AND DEVELOPMENT OF THE APPLE BLOSSOM.

E. S. Goff, Professor of Horticulture, University of Wisconsin.

[Given at the Illinois State Horticultural Convention held in Champaign, Ill., Dec. 11-14, 1900.]

The apple blossom has always been an object of admiration to the artist for its pure beauty and fragrance. Poets have often sung of it, not only for its beauty, but because it is the symbol of a fruitful harvest. Botanists have found in it one species in the great army of plants, and have described it in cold, scientific terms. To the intelligent and thoughtful fruit grower, the apple blossom is not only a thing of beauty, of fragrance, of poetry and of science, but a symbol of health and comfort and profit. He has a full right to demand that the instruments of science, that are so active in these later days in searching out the mysteries of earth and sky and sea, shall be directed toward the apple blossom, with the view of ascertaining to what extent it may be changed from the fitful thing of chance that it often seems to be, to one that shall be subject to the control of intelligence and skill.

The fruit grower knows full well that some seasons his apple trees during May are clothed in an almost spotless garment of pure white, or rose-tinted, petals; in other seasons the flowers are only interspersed here and there among the expanding green leaves; in others still, he looks in vain for any flowers at all. The causes for these variations are at best only conjectured, and his knowledge is not sufficiently definite to enable him to so adjust his practice as to control the bloom to any large extent.

I have not consented to write on this subject because I have any startling discoveries to announce. I have studied it systematically for only two seasons, and while I hope

to contribute some ideas that may clear our vision a little, much more investigation is needed.

My subject divides itself into two—viz., the ORIGIN, and the DEVELOPMENT of the apple blossom.

WHENCE IS THE APPLE BLOSSOM? We all know that it comes from a flower-bud. Some buds expand into leaves only; others expand into flowers and leaves. Observing fruit growers are able to predict with some confidence months before the buds begin to open which ones will show flowers. (Showed the two kinds of buds from actual specimens.) With the microscope we may sometimes discern the embryo flowers nearly a year before they expand.

WHENCE IS THE FLOWER-BUD? There is abundant evidence that leaf-buds and flower-buds are not structurally distinct. (Showed charts illustrating leaf and flower-buds.) Every bud on an apple tree is formed as a leaf-bud; and it is also true that every bud on the apple tree has power to become a flower-bud. In other words, the formation of flowers is only one stage—the final stage of the bud. How do we know this? Because leaf and flower-buds are to some extent interchangeable; i. e., we can, by treatment, cause a bud, that if left alone would not form flowers for years, to form flowers within a few weeks, and we may also, by treatment, cause a bud that we know, from its position is soon to be a flower-bud, to postpone flowering for years. For example, by removing early in the season a narrow belt of bark beneath a bud on a thrifty shoot of a young apple tree, that would not naturally flower for some years, we may cause this bud to form embryo flowers that same season. By cutting off the branch of an apple tree just above a fruit spur, we may cause the bud on the spur that would normally have formed embryo flowers that season, to push into a leafy shoot that may continue growth an indefinite number of years. We know that the terminal buds of growing shoots of the apple sometimes blossom, which

proves these to be potential flower-buds as well as others. Let us remember then that EVERY BUD OF THE APPLE TREE IS A POTENTIAL FLOWER-BUD. It does not follow from this that every bud actually flowers. On the contrary, the great majority of buds are crowded out in the struggle for light, or fall a victim to accidents. We should also remember that the bud can flower but once, and that it necessarily perishes when it flowers.

HOW OLD MUST A BUD BE BEFORE IT FORMS FLOWERS? The age at which the apple bud forms flowers is subject to great fluctuations. It depends much on the position of the bud on the tree, the character of the season, the variety and the treatment. It is certain that embryo flowers sometimes form the same season the bud originates. It is equally certain that they often do not form until the bud is three or four years old, and the terminal buds of main branches may be many years old before they form flowers.

The conditions affecting the age at which the bud forms flowers introduces the question of the immediate causes of the change from leaf-bud to flower-bud.

THE DIRECT CAUSES FOR THE FORMATION OF FLOWERS. The fact that all buds do not form flowers at the same age implies that heredity alone cannot explain the formation of flowers. We must admit that our knowledge on this subject is far from complete, and yet certain theories are well borne out by the observed facts. One of these is that the sap of the bud must contain a certain amount of nutriment before it can form flowers. We had already mentioned that girdling a thrifty shoot of a young apple tree early in the season will often cause the buds above the girdle to form embryo flowers that same season. It is well known that the woody parts of a tree are able to grow only as they are supplied with food prepared in the leaves, and that this food is transported chiefly through the inner layers of bark.

If then we remove the inner layer of bark for a narrow space, we intercept the food current. It is also well known that the crude sap that passes to the leaves from the soil moves chiefly through the so-called sap-wood. If the girdling only reaches to the surface of the wood, the current of crude sap is not cut off. The result is a congestion of food in the part of the branch above the girdle, and so the sap in that part soon acquires the flower-forming qualities, whatever these may be.

We have seen, then, that a restriction to the movement of prepared food tends to cause the buds to form embryo flowers. Every observing apple grower has noticed that when a young apple tree commences to bear fruit, the first fruits are almost always produced on short, stubby branches (fruit spurs) that leave the main limbs at nearly right angles. He has also noticed that as the tree becomes older, these short, stubby branches themselves branch forming what we may call compound fruit spurs. (Showed samples of fruit spurs.) Most of the fruit on bearing apple trees is borne on fruit spurs. Why? In the line of our theory the wrinkling of the bark formed by the union of the branch with its supporting member forms a restriction to the movements of the sap and so causes the formation of flowers.

The sap may become rich in prepared food from another cause than the restriction of the growth current, viz., by concentration due to evaporation of water through the leaves, just as cider becomes richer by boiling down. We may, therefore, in time of drought, have flower-buds formed in parts of the tree where there are no restrictions to the sap, as at the ends of the young shoots. The drier the weather, so long as there is not a damaging dearth of water, the more likely is a given bud to form flowers.

We thus see that situation on the tree and the weather have much to do in deciding whether a bud shall remain a

leaf-bud or shall form flowers in any given season. We are now ready to introduce another proposition that is in part a converse of the first, viz., that as restriction of the growth current and concentration of the sap tend to flower-formation, so dilution of the sap i. e., increasing the water supply, tends to growth. In other words, the causes that tend to fruitfulness are opposed to growth and vice versa; or in still other words, whatever increases the water supply tends to make leaf-buds; and whatever decreases the water supply tends to make flower-buds. The corollary to this proposition is that normal growth will be followed by a normal formation of flowers and that it is as much in our power to control flower formation as it is to control growth. A bearing apple tree, if it is to continue, must produce some new leaf-buds every year, because every bud that flowers perishes. If the tree is to increase in productive power, it must form more leaf-buds than flower-buds, in the average year. Normal growth then is essential to the continuance of an orchard.

WHAT IS NORMAL GROWTH? That growth which confines itself mainly to the younger parts of the tree. If the fruit spurs of healthy trees push into growth, or if sap-sprouts start freely from the older wood, the growth is abnormal, for these imply a disturbance of the natural order, and we should remember that excessive growth always postpones fruitfulness.

WHEN ARE THE EMBRYO FLOWERS FORMED? Our statements as to the relation of flower-buds and leaf-buds imply the answer to this question, because, as we have seen, they are due to contrary causes. We should expect that when growth is taking place, flower-formation is not taking place, and vice-versa, and this statement is borne out by investigation. During the season of 1899, close watch was made at our Experiment Station for the first evidences of flowers,

and these were found, in the single apple tree under investigation, on June 30, and just about this time the early growth ceased. The past season we have shown that the formation of flowers continues until cold weather at least in some varieties.

DEVELOPMENT OF THE FRUIT SPUR. (Illustrated by charts.) When a leaf-bud pushes into growth in spring, a leaf-bearing shoot is formed. In the axil of each leaf a bud is commonly formed, which continues to slowly expand during the season. In due time the leaves fall and we have a reddish brown shoot with a plump terminal bud and several flattish side buds that lie very close to the shoot. The next spring the terminal bud of this shoot almost always opens first and continues the growth of the shoot. Several of the flattish buds below usually open also. Those nearest the terminal bud very often make considerable growth, forming more or less conspicuous branches. As we recede from the terminal bud, the branches make less and less growth, and some of the lower ones form only short, blunt shoots, surrounded with tufts of leaves. In these short, blunt shoots the conditions are most favorable for forming embryo flowers, for they do not receive sap enough to enable them to grow, while their numerous leaves prepare plenty of food, provided they receive light enough. These short shoots then become the fruit spurs. The bud on these shoots is now in its second year, and it should form embryo flowers, if the tree is of bearing age. The next spring, the third spring of the bud's life, it should flower, and we may generally expect the finest apples from these young fruit spurs. As we have seen, they do not always flower until later. When such a bud opens flowers its growing point perishes. If the bud is vigorous, the dying of the growing point causes a bud to push out just below the flower cluster, which continues the life of the spur. This side bud appears to form about the time the embryo flowers form; that is,

the season before it expands. It commonly forms in the apple within the bud scales, where it is protected from the weather during the winter. Sometimes two side-buds form. When the flower expands in spring this side bud also expands, and if the growth of the tree is normal, it commonly forms only a tuft of leaves. It may or may not form embryo flowers the first year of its life. If the growth is abnormal, due to excessive pruning, too much fertility, or water, it may push into a shoot and then it may be years before it flowers. If the growth continues normal, the spurs branch as often as they flower, and thus we have a much branched twig, shaped a little like a deer's horn. (Showed samples.) The fruit spurs furnish most of the apples on old bearing trees, but I am of the opinion that the older and most branched fruit spurs generally furnish under sized apples.

ANNUAL FLOWER BUDS. A statement has recently been made in certain horticultural works* to the effect that the same fruit spur, or the same branchlet of a compound fruit spur does not commonly bear fruit two years in succession. I have investigated the past autumn in regard to the formation of flowers on fruit spurs and find that in our Station orchard, in a number of varieties, the side-bud of the same fruit spur that bloomed last spring has formed embryo flowers in a number of varieties. It would appear, therefore, that in some varieties the same fruit spur may fruit annually. This may explain the well-known fact that some varieties bear annually, while others bear only biennially. Indeed, this is almost the only explanation for continuous annual fruitage, for in favorable seasons for flower-formation almost all of the buds growing from wood more than one year old form flowers.

*Principles of Fruit Growing, Bailey, p. 300; The Pruning Book, Bailey, p. 32.

The cause of occasional excessive fruit crops is intimated in our last sentence. When the seasonal conditions all chance to be favorable for the formation of flowers, all of the healthy reserve buds and many of the buds formed that year form embryo flowers. That is to say, all of the one-year-old buds, all of the two-year-old, and all of the three-year-old buds, and many older ones that are still healthy become flower-buds, with some of the buds not yet a year old. Thus we may have what amounts to two or more ordinary crops of flowers in one year. Of course the outcome of this heavy flower crop will depend upon the conditions of the succeeding season, for we should remember that two seasons are always concerned in an apple crop.

The causes of the excessive fruit crop explain why such a crop is always followed by a scanty one. There are no reserve buds. Only the buds formed the preceding season are available, and the draft on the tree necessary to develop so many apples prevents many of these from forming flowers, even if they are of the annual flowering varieties. It does not follow that an excessive apple crop permanently damages the tree, for it is probably the reserve food of the tree that is chiefly drawn upon for flower and fruit production. The excessive crop does certainly tend, however, to exhaust the soil rapidly.

FORECASTING THE APPLE CROP. To what extent may we anticipate the apple crop? Without a microscopic examination we can only give an opinion as to the yield of fruit we may expect next year. The buds are a guide to some extent, but not an accurate one. Round, plump buds on the fruit spurs generally indicate embryo flowers, but the flower-buds in some varieties are so much smaller than they are in others that they are almost certain to deceive one who has not made a careful study of the subject. A sharp razor and a high-power pocket lens, with a little experience will enable one to say positively whether a given

bud does or does not contain flowers, but without these helps little positive information can be gained.

THE DEVELOPMENT OF THE FLOWERS. Owing to a lack of definite information, I shall say little on the second division of my subject. The embryo flowers in the apple appear to be nearly or quite as hardy as the leaf-buds, hence the flower-buds rarely winter kill. When the weather becomes sufficiently warm in spring the buds swell and all the parts enlarge. The forming flowers in autumn are overtaken by cold weather in all stages of development from those nearly ready to expand to those just beginning to form, hence the flowers on the same tree commonly vary two weeks or more in their time of blooming. The abundant water with which the wood is stocked in spring stimulates an exuberant growth and puts a stop to flower formation in buds in which it has not commenced in autumn. Very rarely this rapid growth appears to cause a flower-bud to revert to a leaf-bud, but this certainly does not often happen in our orchard trees.

After the flowers have expanded the subject of pollination assumes importance. Prof. Waite's experiments have shown that the varieties of apples are very often sterile, or nearly so to their own pollen; that is, they will not bear fruit unless they receive pollen from another variety. This fact is of great importance in the planting and top-grafting of orchards. Experiments seem to show also that prolonged rain during the blooming season may injure the virility of pollen, as well as prevent insects from distributing it. A very light frost while the flowers are open is almost certain destruction to the pistils, but there are doubtless causes that effect the virility of the flowers that lie deeper than any I have mentioned, and that are very little understood. We know that the fruit on all trees does not always "set" well, even when weather conditions seem favorable, and

that the fruit often drops badly shortly after setting. It is not enough that the stamens shall yield pollen, and that this pollen shall be deposited on the stigma. The pollen, the stigma and the embryo must all be in a healthy condition, or fecundation does not result. These subjects call for much further investigation.

PRACTICAL DEDUCTIONS. Let us now consider some of the practical deductions from the foregoing statements. I have often alluded to favorable conditions for flower-formation. What are these conditions? They involve the whole environment of the apple tree. Though largely climatic, they are to a considerable extent susceptible to treatment. We must have, first, favorable growth conditions to produce plenty of healthy leaves and buds, and we should remember that all leaves and buds are formed on new growth. This means a moderate temperature, plenty of moisture early in the season and especially during late autumn and winter, wise pruning and fertilizing, and freedom from injurious parasites. We can promote a moderate temperature by planting on north or northeast slopes, if our country is rolling. By early plowing we prepare the land to catch and hold the spring rains. If these are scanty, we can keep the surface fine and level to check evaporation; if they are excessive we may keep it rough to prevent washing and to favor evaporation. Wise pruning promotes normal growth and admits light to the fruit spurs. Normal growth requires that the pruning shall be moderate and regular, that is, performed every year. It does not remove large limbs unless they are diseased, nor does it head back sufficient to start the fruit spurs. (Effects of insufficient light and of excessive pruning illustrated from charts.) It thins out the outer, smaller branches and saves the older wood with its fruit spurs. It is preferably performed early in the spring. Wise fertilizing means sufficient nitrogen to promote normal growth in a season of average rainfall, and sufficient phos-

phoric acid and potash to develop and mature a good crop of apples with its seeds. The problem of fertility must in the nature of the case be largely studied out by the orchardist for himself, for no two farms are alike. They call for constant and persistent observation, study and experiment. A few general hints may, however, be given. Unless the soil is known to be very poor, manures should not be applied in large quantities at once. Since growth is desired early in the season, stable manures applied early should be well decomposed. As a rule, nitrogen is best given in the form of the so-called cover crops, of which I shall speak later. Wood ashes, where these can be had, will furnish the potash and phosphoric acid. Where ashes are not available, decomposed barnyard manure that is not very rich in nitrogen will answer.

The prevention of parasitic injury means the practice of thorough and timely spraying, and other means for destroying insects and fungi into which I cannot now enter.

Favorable conditions for flower formation require that this growth period shall come to an end about July 1st in this climate, and that the latter part of the season shall be comparatively warm and dry. In the average season and with proper treatment this condition comes as the natural order. If our trees have been over-fertilized or over-pruned, or if the weather has been unusually wet, the growth may not stop early enough, or it may recommence. We should remember that growth late in the season is generally, if not always, at the expense of flower-formation. If the growth inclines to continue after July 1st we can check it by a moderate root pruning, which we may accomplish by plowing deep enough to cut a small part of the roots. If the trees are large, plow a "middle furrow" midway between the rows in both directions and follow with the sub-soil plow. A slight root pruning at this season will generally start the formation of flower-buds if they are back-

ward. I infer this to be true because it is easy to demonstrate that other means of checking growth accomplish this end, and in England, where excessive rainfall generally prevails, root pruning is a very common resort to promote bearing in fruit trees. Follow by sowing a cover crop, to evaporate excessive moisture, to keep the ground cool and to form a protection to the ground during winter. If the ground is at all poor use a cover crop that contributes nitrogen to the soil, like peas or vetches. If the weather turns dry, the cover crop will not grow much and so will not waste much moisture. If it remains wet it will prosper to the benefit of the trees.

Some of you are perhaps saying that you are recommending only the methods that most other teachers and writers have recently recommended. True. What we need is not so much radically new methods as more careful discrimination in the use of the methods we already have. It is to determine, from the behavior and appearance of the trees how much to prune, how much nitrogen to apply, when to root-prune and when, and with what to spray that requires the true skill and genius of the orchardist. And here let me emphasize the great importance of farm school training for the young fruit grower. You owners of orchards may possibly know how to plow and how to grub out a tree better than the professor, but you can hardly be expected to know as much as he about these finer points upon which I have been dwelling, and that have so much to do with the success of our fruit crops.



“Johnny,” said the Sunday school teacher to a small pupil, “what is a centurion?” “He’s a feller what rides a hundred miles on a bike,” promptly answered Johnny.—
The Sunday School Times.

MEETING AT OGDENSBURG.

Editor Wisconsin Horticulturist:

At this late date let me say a few words regarding my trip to Ogdensburg last August. The object was to help the friends there in their local society and to interest them in our State Society.

The village is nearly at the center of Waupaca county on the line of the Green Bay & Western R. R. We took the morning train from Green Bay and were met at the depot by Dr. Morehouse, their secretary, who conducted us to the hotel. In the afternoon he drove out in the country with me to stir up the people a little for the evening meeting.

The meeting was held in the Union church with a full house, probably 125, of which about one-third were men from the farms. After a short musical program the local president, Mr. Nichol, introduced the speaker of the evening. I explained the workings of the State Society and the many good things we learn, mentioning several different lines of study, such as, insects and the methods employed in destroying them, pollinization of flowers, beautifying of our homes, and other topics discussed in our meetings. Of course we spent some time discussing fruit growing.

Then I called for members for the State Society, but the people seemed a little skeptical. After talking until nearly eleven o'clock and with the best of attention, they agreed to send in names for membership. I offered to stay over another train but it seemed unnecessary. Wife thought we had a very good address but of course wives are not supposed to be able to render unbiased opinion at such time.

Not receiving any word from Mr. Morehouse for some weeks after, I wrote him and again waited for reply. He stated that four names had been sent in to our secretary for membership with more in prospect. This seems like small

results but if a living interest has been roused it will grow to greater things. Have written again urging them to attend the annual meeting at Oshkosh.

Respectfully submitted,

IRVING C. SMITH.

Green Bay, Wis.

NORTHERN ILLINOIS HORTICULTURAL SOCIETY.

This society held its 34th annual meeting in the pleasant city of Yorkville, Dec. 4-5, 1900. The delegate from Wisconsin found the veteran horticulturist, L. Woodward, of Marengo, Ill., at the depot in Aurora. He has been treasurer of the Northern Illinois Society for thirty years and still manifests a deep interest in the society, although like Bro. Stickney he has switched off somewhat into the pickle business. Mr. Woodward was a frequent attendant at the meetings of the Wisconsin Society in the seventies, coming as a delegate in '73, '74 and '75.

J. L. Hartwell, the president, and Arthur Bryant, the secretary, were both on hand and worked hard to make the meeting a success.

Charles Hey of Dixon told how he grew strawberries; the summing of his talk seemed to be that his great success was accounted for by the amount of work his wife did in the patch!

A new feature was an orchard class exercise by Jacob Friend which resulted in a free for all discussion on all subjects pertaining to the orchard, from blight to June grass sod. The President's Address was a well-prepared document and "The Practical Work of Horticultural Societies" by State Secretary L. R. Bryant of Princeton was full of instruction.

Your delegate gave his experience with winter apples

and exhibited eleven varieties, all produced by top-grafting. They were Walbridge, Malinda, Eureka, Avista, North-western Greening, Missouri Pippin, Ben Davis, Dominion Winter, Wisconsin Spy, Newell and Scott's Winter. This was well received for the reason that those people are anxious to find more winter varieties suited to their climate.

One of the veterans of their society, who has gone to his reward, did much of his life work near this village or city. I refer to Samuel Minkler. He left a monument to his memory by producing the apple which bears his name. It is a winter variety and several told me it was the best winter apple they had. I found his work was not confined to his own State, for when I stopped at Janesville on my way home I found among a dozen varieties of apples in Bro. Tarrant's cellar more of the Minkler than any other sort and they were grown on top-worked trees, strengthening my faith somewhat. Mr. Minkler's record among his neighbors was like Uncle Wilcox's, that of an honest, upright man. He made the singular request before he died, I was told, that his remains should be drawn to the cemetery in his farm wagon by his faithful mules that had so long worked for him and that his farm hands should lay him carefully in his grave. His wishes were carried out. While living he donated evergreens free of cost to cemeteries and for adorning school grounds, so that Kendall county contains many monuments to his memory. Surely the world is brighter and better for having such men live.

The Northern Illinois fruit lists are very like ours, N. W. Greening, Gano, Ben Davis, Jonathan and Minkler are their best winter apples. Loudon is at the head of red raspberries. Splendid, Wood, Warfield and Clyde are leading strawberries, while Concord, Worden, Moore's Early and Niagara lead in grapes. Currants are about the same as ours, one man speaking very highly of London Market.

Prof. Blair of Champaign gave an illustrated lecture on trimming blackberries and raspberries.

Their next meeting will be held in Dixon. Your delegate was entertained and received a vote of thanks for his assistance in the meeting. There was a large number of young people in at the evening meetings. The high school chorus gave us fine music and we had some fine recitations by the young people.

A. J. PHILIPS, Delegate.

CHRISTMAS GOODIES FOR THE CHILDREN.

PEANUT COOKIES.—Rub to a cream 1 large tablespoon of butter and $\frac{1}{3}$ cup of sugar; add 1 beaten egg, 2 tablespoons of sweet milk, $\frac{1}{2}$ teaspoon of lemon juice and a very little of the grated rind, 1 even cup of pastry flour measured after it is sifted, 1 teaspoon of baking powder, a very little salt; beat thoroughly, then stir in $\frac{1}{2}$ cup of peanuts chopped fine; drop the mixture by teaspoonfuls an inch or more apart on greased tins, place half a peanut on top of each and bake in a rather slow oven. Remove the brown skin from the nuts before chopping.

PEANUT CANDY.—Put 1 cup of granulated sugar with no water into a smoking hot iron frying pan and stir continually until it is melted; add a cup of chopped peanuts and turn immediately into a buttered tin. Cut into squares when partially cool.

WALNUT CREAMS.—Make French cream foundation by taking the white of one egg and an equal quantity of cold water and stirring into it XXX powdered sugar until it is stiff enough to shape into balls with the fingers; make it into little balls and press a walnut meat onto two sides of each ball; place on a buttered platter and set in a cool place over night to harden.

CREAM DATES.—Remove the stones from the dates and fill the cavities with the little balls of French cream.

CHOCOLATE CREAMS.—Let the little balls of French cream stand in a cool place awhile to harden, then dip each one into melted chocolate, holding the ball on the end of a toothpick if you have no confectioners' tongs; place on a buttered platter over night to cool.



**PROGRAM OF THE ANNUAL WINTER MEETING OF THE
WISCONSIN STATE HORTICULTURAL SOCIETY.**

To be Held in the City Hall of Oshkosh, January 14, 15, 16, 17, 1901.

The Wis. State Poultry Association will hold its meeting and exhibition of fancy poultry the same week.

The headquarters of the horticulturists will be at the Tremont House where all delegates will report and all members will please register as Horticulturists and be entitled to reduced rates.

A rate of one-third fare for the return trip has been secured, on condition that one hundred certificates showing that full fare has been paid coming to the meeting be presented to the joint agent at Oshkosh, Thursday, Jan. 17.

Each one attending the meeting should not fail to secure a certificate from the station agent, AT TIME OF PURCHASING TICKET AT STARTING AND ALL TRANSFER POINTS EN ROUTE. Have them read "To the Joint Convention of the Wis. State Horticultural Society and Wis. State Poultry Association." Be sure to hand them to J. L. Herbst, Secretary, as soon as you reach Oshkosh.

Any one desiring a program or any further information about the meeting, address

J. L. HERBST, Sec'y,
Sparta, Wis.

PROGRAM.

MONDAY EVENING, JAN. 14.

Meeting of the Executive Committee of the State Horticultural Society to examine Secretary's and Treasurer's Financial Reports, the Editor's Report, and attend to other business of importance. All having accounts against the Society are requested to send them to the secretary prior to this meeting.

TUESDAY, JAN. 15.

9:00 A. M. Invocation.—President's Greeting.—Appointment of Committees.—Treasurer's Report.—Secretary's Report—Best Five Apples for Southern, Central and Northern Wisconsin, Henry Tarrant, Janesville, T. E. Loope, Eureka, A. D. Barnes, Waupaca.—Orchard Cultivation, T. H. Chappell, Oregon.—General Discussion.

Be sure to renew your membership or become a member by paying \$1 to the secretary.

TUESDAY AFTERNOON.

1:30. Address of Welcome by the Mayor.—Response.—Conditions Affecting Fruitfulness, Prof. E. S. Goff, Madison.—The Individuality of Varieties of Fruit and what they mean to the practical grower, A. L. Hatch, Sturgeon Bay.—Tree Fruits and why Fall Apple Trees are or have been more hardy than Winter Varieties, Hon. Chas. Hirschinger, Baraboo.—Renovating Old Orchards, Prof. L. R. Taft, Agricultural College, Michigan.—Improvement of Trees and Plants, W. W. Pendergast, Hutchinson, Minn., President of Minn. State Horticultural Society.—General Discussion.

TUESDAY EVENING.

7:30. Culture of House Plants, Miss Miriam Jewett, Sparta.—How I saw Niagara Falls for Twenty-five Cents, Mrs. Mary Clark Johnson, Baraboo.—The Pan-Ameri-

can Exposition, Prof. H. E. Van Deman, Parksley, Va.—Our Society, Dr. T. E. Loope, Eureka.—Music and recitations by local talent.

WEDNESDAY MORNING, JAN. 16.

- 9:30. Shall the Farmer Grow Cherries, L. G. Kellogg, Ripon.—Behavior of Plums at the Wis. Experiment Station, Prof. E. S. Goff.—Subject optional, C. G. Patten, Charles City, Iowa.—Insect Enemies of Tree and Fruit and how to Control them, Prof. E. C. Green, Urbana, Ill.—In view of depredations of insects and fungi, is it advisable for the farmer to grow his own fruit? L. F. Laiten, Omro.—Reading Prize Essays.

WEDNESDAY AFTERNOON.

- 1:30. Some of the Newer Varieties of Strawberries, Geo. J. Kellogg, Lake Mills.—Fancy Berries, R. M. Kellogg, Three Rivers, Mich.—Small Fruits, C. Phillipson, Oshkosh.—Grape Culture, J. W. Van Allen, Barnum.—The Garden, B. S. Hoxie, Evansville.—How to Market Vegetables, Irving C. Smith, Green Bay.

WEDNESDAY EVENING, 7:30.

Program under auspices of the Algona Horticultural Society.

THURSDAY MORNING, JAN. 17.

- 9:00. Signing and Stamping Certificates.—President's Address.—Election of Officers.—Reports of our delegates to other Societies.—Reports of delegates from local societies.—Reports of delegates from other State Societies, Minnesota, Iowa, Illinois, Michigan.—Report of Observation Committee.

THURSDAY AFTERNOON.

- 1:30. Shrubbery for the Lawn, H. C. Christenson, Oshkosh.—Ornamental Shrubbery, Eugene Secor, Forest City, Iowa.—Permanent or temporary home for the

winter meeting, F. C. Edwards, Ft. Atkinson.—Unfinished Business.—Call for certificates before agent leaves.

A special session will be called by the president, if necessary, Thursday evening.

PREMIUM LIST.

In view of the successful apple crop the past season, there promises to be a large display of fruits at the meeting. Liberal premiums have been offered by the society and it is expected that many new and promising varieties will be shown. The Algoma Horticultural society will also give special premiums on fruits, vegetables and flowers, and this will bring out a fine exhibit in itself.

Best display seedling apples, 1st, \$5; 2d, \$3. Best winter seedling, \$1.

Best plate of any meritorious variety of apples, correctly named (for example, best plate of Wealthy, best plate of Fameuse, best plate of Willow Twig, etc.), 1st, 50c; 2d, 25c.

Largest apple, 1st, \$1.

RULES.

1. No premium shall be awarded to inferior or decayed fruit.
2. Four apples shall constitute a plate; seven crab apples.
3. All plates must be correctly labeled; blank labels and plates will be furnished by the Society.
4. Competition is open to all. No entry fee will be required, but all persons receiving premiums must be, or must become, members of the State Society.
5. All exhibits must be in place before noon of the second day of the meeting.

ESSAYS.

Premiums will be given for Essays as published in the November Horticulturist.

