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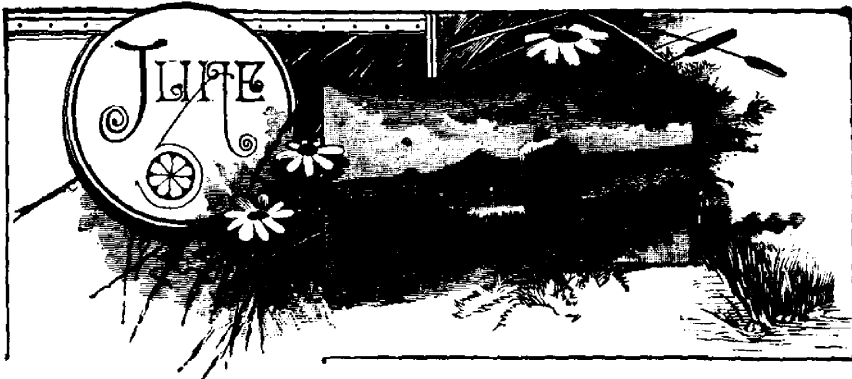
PEONIA

THE
Canadian Horticulturist

VOL. XVI.

1893.

No. 6.



HERBACEOUS PAEONIA.



AMONG all the long list of herbaceous perennial plants with which we may decorate our lawns, there is none more desirable than the herbaceous paeonia, of which our colored plate this month is an excellent representation. Some varieties are delicately scented, almost equal in perfume to the rose; and their huge blossoms, with their wide range of colors, as white, salmon, pink, purple, and even scarlet and crimson, make them very showy, and very suitable for planting in beds a little distance from the house, while if set off by a dark green background, they will be yet more pleasing. Another suitable position is in front of a large shrubbery, and with perennials in the wide borders of the lawn; for it is able to endure a certain amount of shade.

The arrangements of shrubs and perennial flowering plants is too little considered in planting, and we too often see them dotted about over a lawn in the regularity of a corn field. Such a mistake spoils the effect. The most pleasing arrangement is secured by grouping varieties together, with the taller growing ones in the centre and the whole perhaps edged with spring flowering bulbs.

One essential to success is a deep rich soil with plenty of manure. If thus treated, they will well repay the outlay by most magnificent blooms.

The paeonia is widely distributed by nature, being found in Europe, temperate Asia, China and North America. There are two principal genuses, the shrubby or tree paeonia, and the herbaceous paeonia; of these there are some seventy-five named varieties, two-thirds of which belong to the latter class. They are called after an ancient Greek physician, Paeon, who used the plant in his medical practice.

TUBEROUS BEGONIAS.



I HAVE written this paper on the tuberous begonia because I believe there is the greatest future before it of any plant of recent introduction, whether for the conservatory, the window garden or the open garden. I think one reason why it is not better known is that we have been too apt to think it would not flourish except under glass, and therefore it has not been given a fair trial as a bedder. We have grown it moderately at Forest Hills until last year; then quite extensively, having planed out some thousands of them in different parts of the grounds, in large and small beds and on graves. In all cases they were the best beds of flowering plants in the cemetery, affording a remarkable variety of color, white, yellow, orange, rose, scarlet and crimson, in numerous shades. Then their comparison with other flowers show greatly in their favor. The geraniums thus far have taken the lead as the best bedders; but how a rainstorm destroys geranium flowers, especially of the single varieties! But with the begonias it is not so; they are bright again in twenty-four hours, flowers and foliage standing up in bright array. At Forest Hills we must have large quantities of bedding plants and of the best. The introduction of the Crozy cannas and the tuberous begonia forms a great advance. It is to be hoped they will soon take the place of the faded coleus, and perhaps others may as well be spared, as they reflect no credit on a well-managed place. I think there is very little character to the so-called "foliage bed." One can get material at a dry good store, with which to produce as good an effect. I do not include in this remark the sub-tropical beds, but those filled with so-called foliage plants. Flowering plants are decidedly better. What "foliage" bed can compare with a solid mass of tuberous begonias, or a large bed with Crozy cannas in the center, surrounded by a broad belt of heliotrope and tuberous begonias as a border? Such a bed is not only an object of beauty, and a delight to all observers, but, if some cut flowers are desired, here they can be had. If one wishes a good bed of flowers, a bright vase, a cheerful window, or some choice cut flowers for decoration, the tuberous begonias will not disappoint either desire.—Ex.

The same treatment is recommended for the pear as for the apple, before blooming, but the copper-arsenic solution is advised after blooming.

LETTERS FROM RUSSIA—XIV.

Double Plum.

In the garden of Chernigov, there grows a very novel plum called the Double plum. It is made up of two halves, joined firmly together when the fruit is green, but, when ripe, easily separated. Two stones grow on one stalk; they are small, oblong, and cling to the flesh, which is orange colored, sweet and juicy, but not very excellent in flavor. The color of the plum is red, with a blue shade, and sometimes a yellow one is found. The plum ripens in September, but will hang on the tree until frost.

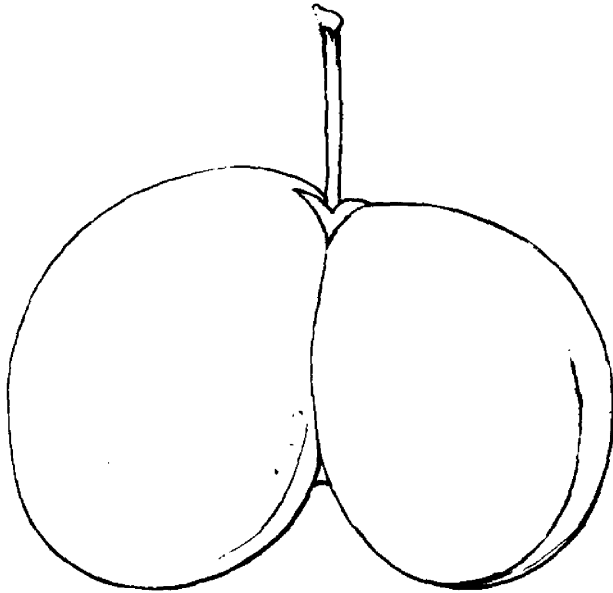


FIG. 541—DOUBLE PLUM.

The tree grows well and yields yearly crops, but is very tender and freezes north of Chernigov. The plums are not all double, some are single, but about seventy per cent. are double. The fruit is good both for table and cooking, and commands a good price in the markets on account of its peculiar shape. Fig. 541 represents its usual appearance, though sometimes it is larger.

New Crabs.

Prof. Shroeder, of Moscow, secured two very valuable hybrids by crossing several Russian garden apples with Siberian crabs. The first one he called Avenarius Hybrid. It is a little yellow apple with a red blush, long stalk,

excellent, tender and sweet. The second one, Scroeder's Muscat Hybrid, (Fig. 542), is in size from medium to large, with yellow skin and fine red stripes, closed calyx and yellowish, juicy flesh, sub-acid taste, ripens in January. This apple is destined to have a great future in very cold countries, as in hardiness it is not excelled by the wild Siberians.

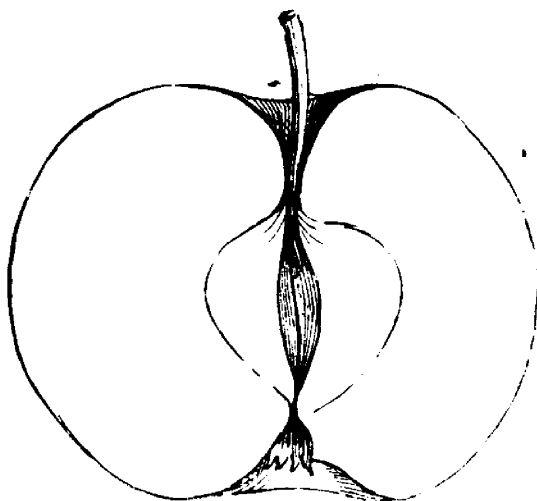


FIG. 542—SCROEDER'S MUSCAT HYBRID.

I received from south-western Siberia a species of wild apple, of which the leaves only are greenish red, and the rest, as bloom, bark, fruit and flesh, is all red. This native species has no botanical name, and it certainly will become a very ornamental tree in our public parks. It will also have some value as a fruit tree, because it bears a small apple of good quality, which ripens in winter. When my tree has made some growth I will send you some scions.

RAKE the lawn, removing sticks, stones and other rubbish you may find upon it, repair the bare patches, and roll it over to leave all clean and even for the mower. The best tool to use on a fairly good lawn is a close-toothed wooden rake, it takes off all the rubbish without ruffling the earth. But where the grass has been left quite long and it has died and matted on the ground, a large steel-toothed rake removes it best. In the event of bare spots where the lawn grasses had been killed out by last summer's drough, or smothered by crab grass, with the steel-toothed rake scratch off the dead grass, at the same time ruffling the surface of the ground a little, then sow some grass seed on it, and roll it.

NOTES FROM THE WORLD'S FAIR.—II.

April 26th.



THE Opening Day is very near, but President Cleveland will see little of the exhibits unless he comes again. The buildings are a mass of packing cases and unfinished courts, and only here and there one is so far completed as to receive its display. Prodigious efforts are being made to prepare for opening, and, notwithstanding the most extravagant prices demanded, it is estimated that there are over fifty thousand men employed in various ways on the grounds. Then, two weeks of the worst April weather ever known to the writer has delayed all outside work. The little steam

launches that take the tired visitors about in the pretty lagoons from one building to another, are a great accession, and the easy rolling chairs, in which the visitor is easily pushed along by fine, nobby young men, will all help wonderfully in giving a restful mode of transfer from one part of the grounds to another.

The boom for high prices of accommodation has run very high and must surely break. \$1.50 to \$2 per day for a room, without board, is absurd, in a city of nearly a million and a half which is so easily able to accommodate 200,000 or more visitors per day.

The Customs regulations are giving the writer heaps of trouble getting hold of our goods. A special permit must be got to move our several car-loads of fruit and vegetables from the City Cold Storage into the grounds, or for moving about from one building to another; and no box can be opened without a Customs inspector to check off the contents, the same to be returned to the box at the close of the exhibition, or duty paid.

The Administration Building, where most of the business offices of the World's Fair are situated, is quite unique, and of peculiar interest. By many it is considered the gem of the Exposition buildings from an architectural standpoint. The grand dome, which is open to the floor in the centre, is two hundred feet in height, gilded without and within, and richly decorated. It has four pavilions, eighty-four feet square, and the general style is that of the Erench renaissance, with the first story Doric and the second Ionic. This building, with an heroic statue of Columbus before the main entrance, will be the first to attract the attention of visitors after their arrival at the immense railway terminal station, and will give a very favorable "first impression."

The attention of the visitor is naturally directed next to the largest building upon the grounds, the *Manufactures and Liberal Arts*. Leaving Administration,

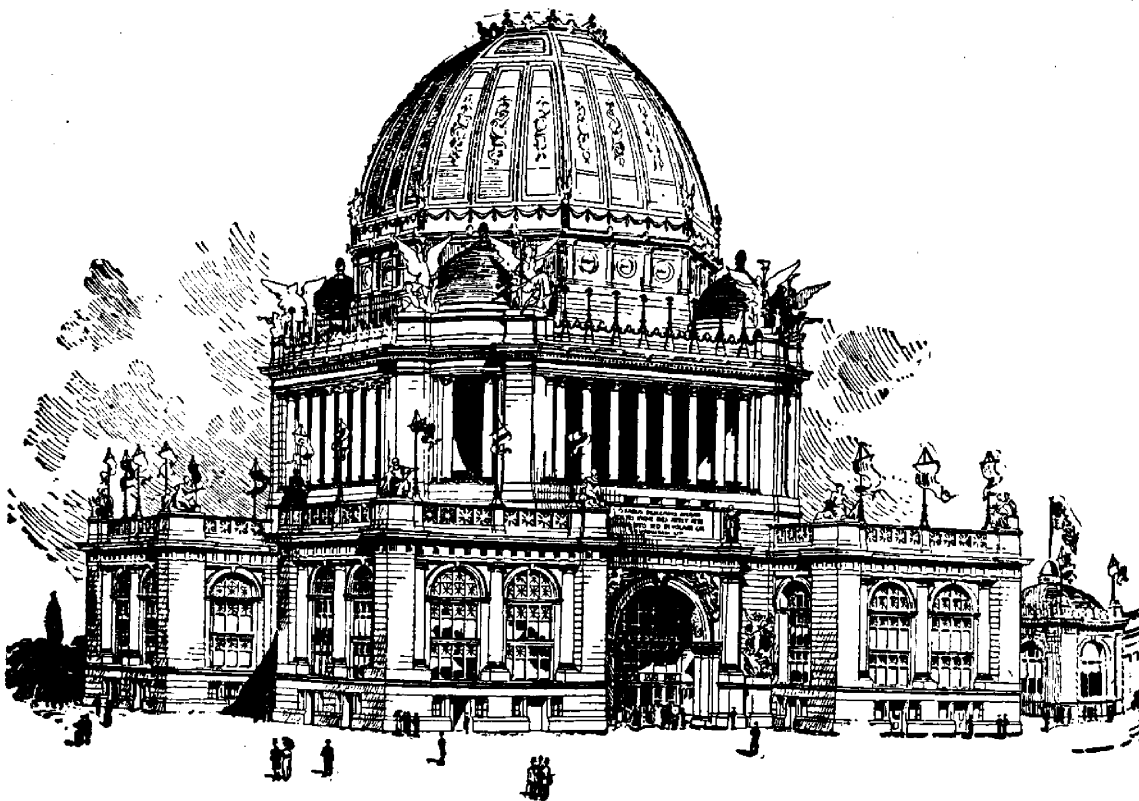
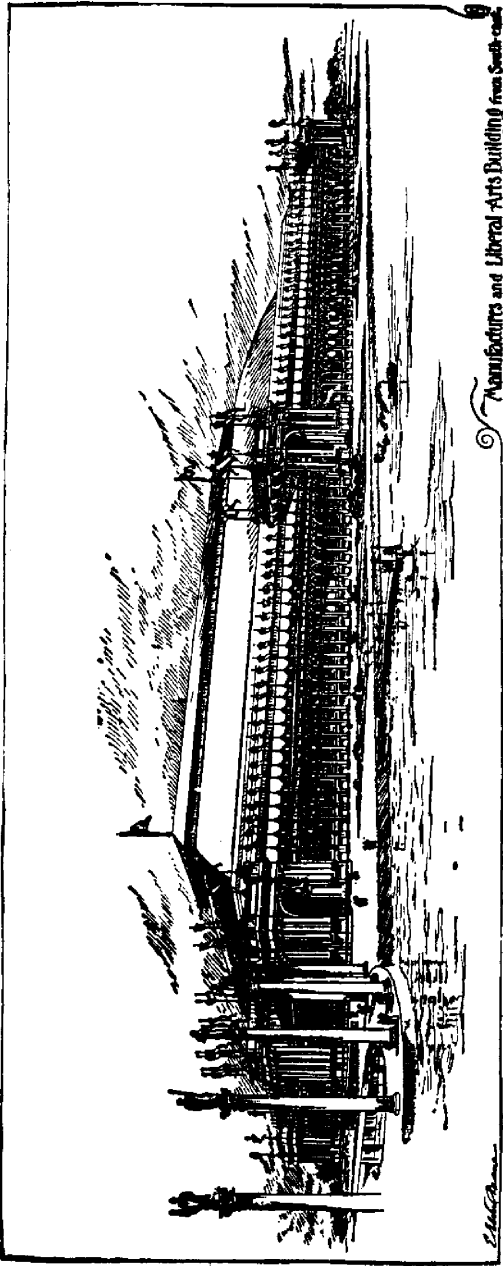


FIG. 543.—ADMINISTRATION BUILDING.

he walks down towards Lake Michigan in the most attractive and wonderful of places—where electric fountains play, and countless pieces of elegant statuary and massive architecture attract the attention, while electric launches in the beautiful harbor offer delightful sails.

Along the lake front, an excellent stone cement walk has been constructed, and going along it southward, the Liberal Arts Building is on the left. Inside, the innumerable list of packing cases and the elaborate courts promise wonderful displays, which as yet it is safer to view from outside.

Our engraving of this building of Corinthian style, gives one a very poor idea of its immense proportions. The ridge of its roof is one hundred and fifty feet high, and is covered with heavy, fluted glass, supported by gigantic iron trusses. The whole encloses an area of 385 by 1,400 feet, so that, with its side



galleries, this building has about forty acres of floor space.

May 1st.—The great and imposing ceremonies of the opening of the World's Fair by the President are over; but, owing to the continuous rains, the roads were sloppy, and the pleasure of the occasion was more imaginary than the disgust which arose from the splattered condition of boots and clothing of those who were not favored with reserved seats. The scene in front of the Administration Building was almost indescribable; a black sea of several hundred thousand heads, with necks upstretched to catch the least sight of "Grover," as they call him; the beautiful bridge, and large lagoons studded with numerous launches, and crossed by picturesque bridges, and, above and beyond all, the elegant architecture of the buildings, worked out as the result of many ages of study and experiment.

Many of the exhibits are far from complete. Our own horticultural exhibit, concerning which I intend to write in the June number, is as far advanced as any, but owing to uncontrollable delays, very much work yet remains to prepare it for a presentable display. The greatest disappointment comes from the poor management of the fresh fruit at Cold Storage. The paper wraps

were removed, allowing rot to spread from one apple to another; the varieties were not put back in the same boxes from which they were taken, thus confusing

the key of numbers ; and much that went in was entirely missing or removed.

The bottled fruit shows in good condition, so that, notwithstanding all, our display is very creditable to Canada. Indeed the Canadian fruit occupies about one-sixth of the entire space devoted to Pomology ! It attracts the attention of every passer-by, and causes many curious remarks. One says, "I did not know they could grow fruit in Canada." Another, "Why, this is the most attractive part of this building," and another, "Why, I can see apples at home, without coming all the way to Chicago."

May 17. An important day for Canadians at Jackson Park. Lord Aberdeen, who has been named by England's prime minister, the next Governor General of Canada, in company with Lady Aberdeen, Miss Sullivan, Sir Henry Drummond and several other notables, visited us at the Canadian Pavilion at 4. p.m.

The reception room was well decorated with flags, and through the kindness of Mr. Houston of the Ontario Horticultural Exhibit, the writer was able to arrange for some fine groups of thujas, palms calceolarias, etc, on each side of the chair reserved for His Excellency.

There was very little formality, and many introductions. Mr. Larke's address was extempore, but wonderful impressive of the kindly feeling which



FIG. 545.—THE CANADIAN PAVILION, JACKSON PARK.


Canadians bear toward Lord and Lady Aberdeen ; and the respondent address was equally sincere and appreciative.

Our Canadian Pavilion is not a showy building, such as the German, the Illinois, the Brazilian, etc.; but it is a plain substantial one, of a style of architecture characteristic of English buildings, where little is made of exterior appearance, and much of interior finish. The rooms are all finished, both walls and ceilings with native woods, many of which are of superior beauty. There are no exhibits here, but each province has a suite of rooms for her officials, and the reception room in the middle is spacious enough to seat a large gathering of Canadians.

As superintendents of the various departments, we were quite disappointed that Lord and Lady Aberdeen could not visit our courts ; but as there are seven or eight of these in as many different buildings, we have to be content with a shake of his hand and a promise to call round in the month of October.

June 1st.—At last we may announce to our Canadian friends that the exhibits are about ready for visitors, and that no one who can afford it should miss this grand opportunity.

QUEBEC APPLES AT THE WORLD'S FAIR.

 HE Quebec fruit display occupies the centre aisle of the Canadian Court, and is worthy of notice on account of the great number of varieties of apples it contains, which are little known outside of that Province, as for instance, Reinette verte, St. Hilaire, Selwoods Reinette, Buzzell's Seedling, Barre Rouge, Pomme de fer, Reinette barre, Auclair, St. Antoine, Argenteuil, la Tuque, etc. Hardiness of course, is a prime consideration there, and this leads to quite a different selection of varieties from that which is made in more southerly districts.

The large and interesting collection that has been made is very creditable, there being about eighty varieties of fresh apples of 1893 on the tables on the 10th of May. Nearly twice this number had been collected, but many varieties were fall apples which could not be kept through so long, in a condition fit for exhibition.

Some of the choicer varieties shown, with which we are all more or less familiar, are the Wolf River, of Minnesota, that excellent seedling of the Alexander, which in some cases can scarcely be distinguished from its parent ; the La Rue, of Brockville, Ont., Scott's Winter, Haas, and the Russians, Antonvka, Longfield, Arabka; and Switzer.

PROMINENT CANADIAN HORTICULTURISTS—XXI.

MR. JOHN CRAIG, OTTAWA, ONT.



ANY person who has heard Mr. Craig address a meeting of farmers or fruit-growers, on subjects connected with his department of study, must be impressed with a sense of the practical knowledge and scholarly manner of the Horticulturist of the Central Experimental Farm; and the more one becomes acquainted with him, the more one becomes satisfied with the propriety of his appointment. Nor is it only his natural fitness for this work that justifies his appointment, for this is also backed up by previous training exactly suited to his present requirements.

John Craig is a native of the Province of Quebec, and was born in 1864, at Lakefield, Argenteuil County. When he was eight years old his father moved to Abbotsford, to take charge of that well-known experimental farm belonging to the late Charles Gibb, where so many hardy Russian and other apples were under test; a property which has since come into the possession of Mr. Craig's people. It was on this farm at Abbotsford, and associated with so learned a horticulturist as Mr. Gibb, that Mr. Craig received his first impressions in horticulture. After completing his public school course at Abbotsford, he was sent to the high school at Montreal. This course completed, he returned to Abbotsford and spent two years as the private secretary and assistant of Mr. Charles Gibb. It was at the suggestion of the latter that he entered the Iowa Agricultural College, as a special student of horticulture and allied sciences; he thus came into contact with Prof. J. L. Budd, whose visit to Russia in company with Mr. Gibb, to gather hardy fruits for testing in North America, has been frequently referred to in our reports. Mr. Craig remained at this college for three years, completing his course of study there, and receiving a diploma in the class of 1887.

During the period of his college work, he employed his summer and winter holidays in practical nursery and greenhouse work, and his last year, as assistant of Prof. Budd, in the important branches of hybridizing, propagating and testing varieties.

On the organization of the Iowa Experiment Station, he was elected assistant director, and was given the special charge of the Department of Horticulture. During his stay at this Station, he was sent out by the Board of Control on a botanical expedition, with the especial object of making as complete a collection as possible of the wild and cultivated grasses. In the pursuit of this work he made an extended tour through Dakota, Montana, Washington, Oregon, Utah and Colorado.



MR. JOHN CRAIG, OTTAWA, ONT.

In January, 1890, he was appointed Horticulturist of the Central Experimental Farm for the Dominion of Canada, a position which he still fills in a most creditable manner. Of his work since that time, it is scarcely necessary to speak, as our readers are kept well posted concerning it, by means of his annual reports, bulletins, evidence before the Horticultural Committee of the House of Commons, addresses at meetings, newspaper correspondence, etc.

At the annual meeting of our Association, held in the City of Hamilton, in December, 1890, Mr. Craig was elected the director to represent Ottawa and the Counties of Lanark, Renfrew, Carleton and Russell, which constitute agricultural division No. 2. Since that time his contributions to our journal and report have been frequent and valuable.

Some of the more important lines of work which he is pursuing at Ottawa are indicated under the following heads: (*a*) testing fruits for the north, (*b*) crossing and developing new varieties, (*c*) systematic study of the methods of propagation, (*d*) fungus diseases and the best way to destroy them. As Mr. Craig's labors are directly in the interests of the fruit growers of the Dominion, it is only right that he should receive from them every possible assistance they can render him for the prosecution of his work. This they may do by keeping him well posted concerning new fruits, trees or plants which are discovered in their various localities; by distributing freely the bulletins issued by the Farm; by testing the varieties sent out, in order to know their adaptation to the various parts of our country; by experimenting with the various fungicides; giving full reports to him, and in various other ways.

Mr. Craig is a member of the principal horticultural and pomological societies of the United States and Canada, of the American Forestry Association, and of the American Association for the Advancement of Science; and thus, by frequent contact with the leading students of horticulture and allied studies in America, he is enabled to keep the fruit-growers of the Dominion posted as to the very latest discoveries which promise to help them to the greater success in their chosen industry.

The Crosby Peach.—There seems to be plenty of evidence in favor of the Crosby peach. There is little doubt as to its hardiness, but it is excellent in other respects. Mr. Charles Wright, a successful peach raiser of Delaware, pronounces it of delicious flavor and while not so large as Crawford or Old-mixon, it will bear a crop when they fail. Another life-long peach grower of Delaware says that the Crosby has a beautiful color and is a perfect freestone.—R. N. Y.

Scabby apples rot much earlier than those free from scab, and spraying with fungicides will save at least 50 per cent. of this loss.

APPLE GROWING IN QUEBEC.



IN a paper on this subject, read before the Farmers' Congress at Quebec, Mr. R. W. Shepherd, Jr., of Montreal says: As compared with our sister province of Ontario, the area devoted to the cultivation of the apple in this province is insignificant. The exportation of apples from Ontario to Great Britain has assumed large dimensions; probably three-fourths of this trade passes through our port of Montreal, and not a small proportion of it is handled by Montreal fruit merchants.

There does not seem to be any means of ascertaining the extent of the annual crop of apples in this province, nor yet the quantity of apples exported from the province to Great Britain, but from personal observation and from information obtained from exporters, probably not more than 10 per cent. is exported, and probably another 5 to 10 per cent. sent to our great North-West. Since the McKinley tariff, the exportation of apples to the New England cities of the United States, which a few years ago, from our border counties in the Townships, was considerable, has altogether ceased. We may, therefore, conclude that fully 80 per cent. of our provincial grown apples are consumed at home.

The question naturally arises, "Shall we keep on planting, for the purpose of growing more apples for home consumption?" No! we cannot recommend it. The profits of apple growing are smaller than they were a few years ago, owing to over-production, the McKinley bill,—and also because Quebec is now the slaughter market for a large portion of the Ontario fruit which is not exportable. But should we increase the area of our orchards with a view of exporting to the North-West? Possibly here we have an outlet for a large proportion of our fruit, but Ontario would be our great competitor here, having the advantage of cheaper freights in consequence of proximity to that market in the west. You will ask why so small a proportion of our provincial apples is exported? In answering this question one has to consider the varieties of apples grown here, and we find they are principally soft fruit, fall and early winter varieties, unsuitable for exportation to Great Britain in barrels. The cultivation of the "Fameuse" for exportation in barrels cannot be recommended. Dealers look upon that variety as extremely "risky;" yet the Fameuse is our leading commercial apple. It is being followed closely by "Wealthy," however, which, for its adaptation to most soils and its greater hardiness of tree, surpasses the Fameuse. That dealers will take to the "Wealthy" for export is doubtful. Its delicacy of skin and flesh too closely approximates the Fameuse. To give you an idea how cheap apples of this class were sold in England last fall one of our largest exporters informed me, the other day, that he bought five fine Fameuse on the streets of Liverpool for one penny. No wonder the exportation of fall and early winter apples was so

disastrous to Canadian exporters last season. Such fine fruit as our best Fameuse, Wealthy, Winter St. Lawrence and McIntosh Red cannot be exported in barrels profitably, because it is not the proper package for fruit of such delicate texture. No matter how carefully selected and packed in barrels, bruising of each specimen must naturally occur, and bruising means premature decay, hence fruit of this description is sacrificed at "five a penny." But if we cannot ship our best apples in barrels they may be shipped in compartment boxes with complete certainty of arriving in good condition, to be put on the Londoner's dinner tables unbruised. I have tested this mode of packing our best table apples for export, the last ten years, with great success. At first the boxes were made with open spaces on sides and top for ventilation (that was the Cochrane case), but experience has led me to adopt a close box, the only ventilation being the small hole at each end; but really the object is not ventilation, but for convenience in handling the package. We find that the boxes are never turned upside down when the freight handler can insert his fingers into these holes, and lift the box so easily. Last season I exported several hundred boxes of apples and not one complaint as to packing, but many letters of recommendation. The Fameuse and Wealthy boxes hold 16 dozen and four apples (196 apples) or nearly half a barrel. The package, complete, including $3\frac{1}{2}$ inch wire nails with which we nail the cover, bottom and sides, in addition to the nails that the box manufacturer supplies, costs 45 cents, or thereabout. Of course only the very best and most perfect fruit can be packed in these boxes. That a large trade can be worked up in shipping to Great Britain table apples, packed in this manner, is rather doubtful, as the fruit by the time it reaches the other side becomes pretty costly,—but I must confess that from a small beginning I have found the demand to increase every year, so that last year I shipped nearly double the number of boxes that I did the year previously. But we can scarcely expect that apples in boxes, in a wholesale way, can compete with the trade in barrels,—therefore I cannot recommend a large increase in the area of our orchards for the purpose or shipping fruit in boxes.

What is to be done? You will ask if you do not recommend increasing the acreage of orchards by the planting of such varieties as succeed well, viz.: Fall and early winter varieties. What is to be done? My answer is, plant late keeping varieties, hard apples for exportation. But the cultivation of winter apples for export has never been undertaken on a large scale in this province, as it is in Ontario, because of the uncertainty of knowing what variety of tree is hardy enough, and suitable to cultivate for the trade. Our old time favorites "Pomme Grise," "Bourrassa" and "Calvilles," etc., are no longer cultivated, having become unprofitable. No, doubt, the apple growers of this province have been bravely trying and testing the growing of winter apples for many years. We have only to look at the large number of varieties of winter apples that we have collected for the World's Fair, Chicago, which are now in cold storage there, such

varieties as :—Flushing Spitzenburg Ribston, Canada Baldwin, Wagener, Argenteuil, Greening, Seek no Further, Yellow Bellefleur, King of Tomkins, Perry Russet, Mann, Northern Spy, Ben Davis, Jonathan, Golden Russet, Hubbardson, Nonsuch, Fallawater, Tolman Sweet, American Baldwin, Pomme Grise, Longfield, English Golden Russet, Scott's Winter, Kellog Russet, Pomme de Fer, Red Spitzenburg, Pewaukee, Iron Apple, Blue Pearmain, Canada Red, W. W. Calville, Hibernial Magog Red Streak, Bourassa, Utter's Red, Rochester (so called), Bethel, Caville Blanc, Rox Russet, Swaar, Reinette de Canada.

This is proof positive that most of our orchardists are experimenting and trying to discover an apple, or a number of apples, suitable to cultivate for the export trade ; but that they have not quite succeeded is proved by the small proportion of our provincial grown fruit being exported. No one yet, that I have heard of, has had the temerity to plant out a thousand trees of any one variety of a late winter apple, expecting to succeed. Scarcely any of the Western winter apples are hardy enough to succeed in this province. Baldwin, Northern Spy, Greening, King, which are the standard winter apples sent to the English market to day from Ontario, will not succeed in our apple-growing sections, if planted on a large scale, although I believe Northern Spy is grown in Huntingdon County in a small way.

We have turned our eyes to Russia, too, to discover a winter apple suitable for our needs ; but really, so far, although we have found many nice apples, decidedly handsome apples, yet no late-keeping ones that can compete with the standard Ontario apples just mentioned, in the English market. Bogdanoff will not do ; Longfield is not worth cultivating except in extreme northern sections, and then is only fit for home use—a pretty apple, but undersized—the quality, however, is passable. What can we do, then, in the way of growing winter apples on a large scale for export ? Can we compete with our brothers in Ontario ? I think that in the more favorable parts of the province something may be done. We have, by practical test and observation, after many years, found out two or three varieties which, I think, may safely be recommended until something better is discovered.

First on the list is "Scott's Winter," a native of Vermont, tree quite hardy and productive. The apple is of fairly good quality and handsome appearance. The only objection that has ever been raised against Scott's Winter is, "that it is rather small." I am better pleased with Scott's Winter every year ; the fruit does not spot and is a late keeper. I can recommend its cultivation in the Ottawa Valley and district of Montreal. Dr. Hoskins, that grand old pomologist of Newport, Vermont, says it cannot be surpassed for hardiness of tree and productiveness, and endorses my report of it. He says : "And this Scott's Winter, Professor Budd, of Iowa, declares to have the microscopic characteristics, as regards wood and foliage, of the Russians, and believes it to be a chance Russian seedling. For myself, I am inclined to look upon it as a proof of the

gradual acclimation of the seedlings of West European stock to American conditions." Although Scott's Winter may not quite meet the views of exporters as to size, yet I would not hesitate to plant out one thousand trees of that variety, and expect to make money, too.

2nd. A second apple is the "Canada Red." It is only within the last three weeks or so that we have found out that Canada Red is, undoubtedly, a very hardy tree. For upwards of thirty-three years, to my certain knowledge, this variety has been cultivated at Hudson on the Ottawa, forty miles west of Montreal, and within two miles of my own orchard at Como. Canada Red is not a new variety, in fact, it is an old variety, which is at the present day largely cultivated in Ontario and New York State. Yet, strange to say, no one ever supposed Canada Red capable of withstanding the rigorous winter climate of the Province of Quebec. The trees are over thirty-three years old, and out of an orchard of 1,200 trees, of mixed varieties, planted so long ago, Canada Red is the most healthy, hardy and productive of all, surpassing Fameuse and St. Lawrence. "They are the survivals of the fittest," therefore, I think Canada Red may safely be recommended for planting in more favorable sections of the province with success.

3rd. The "English Golden Russet," at least, so-called by the late Chas. Gibb (but to distinguish it from the American Golden Russet, I have catalogued it for my nursery as the "Fisk Russet") is a very hardy tree. Mr. John Fisk, of Abbotsford, from whom I obtained my trees at first, says it is the only late winter apple that they can safely grow at Abbotsford. The fruit is a favorite with exporters for shipping in mid-winter, and is worthy, therefore, of cultivation for that purpose.

4th. "North-West Greening," from Wisconsin, an ironclad, which we might grow to compete with Rhode Island Greening, is worthy of mention.

Reports 1892, from Wisconsin, regarding North-West Greening, has been thoroughly tested and proved equal to the "Wealthy" in every respect as a tree, while in quality of fruit and keeping it is superior to that variety. The fruit is medium to large, greenish-yellow, often fine blush; flesh, fine grained, firm, juicy, sub-acid, good; season, January to June. This variety has had twenty-five years' trial in Wisconsin.

Here we have, then, three or four varieties, hard winter apples of known hardiness of tree, that may be grown on a large scale (until something better is discovered) for this export business. Three or four varieties are enough. There is no advantage in growing too many varieties; on the contrary, it is a great disadvantage. From the exporter's point of view, he would much prefer to buy 2,000 barrels of two varieties, than the same number composed of eight or ten varieties. With a large number of barrels of one or two varieties only, your sales will be made quicker and more profitably. Therefore, the conclusion I arrive at is this: If your orchard is well situated, near the city market, possibly the

growing of fall and early winter apples in the future will pay, but you must bear in mind that after the experience of last season, and the dreadfully heavy losses made by exporters in shipping the early winter apples of Ontario, they will be "wary," and our chief market centers are likely to be more than ever invaded by fruit from Ontario—but it is a risk we must all run.

The orchardist, at some distance from market, however, would do better to plant late winter varieties. He is sure of a market in any case. He may either sell to the exporters or he may export the fruit himself. Moreover, the fruit being of a hard kind, not easily bruised, nor decaying on his hands, he can afford to keep his apples until such time as the prices in winter advance.

APPLES AS MEDICINE.

Chemically, the apple is composed of vegetable fibre, albumen, sugar, gum, chlorophyl, mallic acid, gallic acid, lime and much water. Furthermore, says the Southern Clinic, the German analysts say that the apple contains a larger percentage of phosphorous than any other fruit or vegetable. The phosphorous is admirably adapted for renewing the essential nervous matter, licithin, of the brain and spinal cord. It is perhaps for the same reason, rudely understood, that the old Scandinavain traditions represent the apples as the food of the gods, who, when they felt themselves growing feeble and infirm, resort to this fruit for renewing their powers of mind and body. The acids of the apple are also of signal use for men of sedentary habits, whose livers are sluggish in action, these acids serving to eliminate from the body noxious matter, which, if retained, would make the brain heavy, dull, or bring about jaundice or skin eruptions and other allied troubles.

Some such an experience must have led to our custom of taking apple sauce with roast pork, rich goose, and like dishes. The mallic acid of ripe apples, either raw or cooked, will neutralize any excess of chalky matter engendered by eating too much meat. It is also the fact that such fresh fruits as the apple, the pear, and the plum, when taken ripe and without sugar, diminish acidity in the stomach, rather than provoke it. Their vegetable sauces are juices, and converted into alkaline carbonates which tends to counteract acidity.

It is not known that this treatment will prevent the black knot, but cutting away and burning the diseased branches will accomplish the result.

An Effective Weeder.—A steel rake, with long and sharp teeth, is one of the most effective of weeding implements, and if used "early and often" will keep land clean, with little labor.

COCCOTHAUSTES VESPUTINA.—(EVENING GROSBEEK.)



VERY little is known here about these birds. We hear about their having been seen in different parts of Ontario, but only once, that I am aware of, have they visited this district in a period of forty years. That was in February, 1889, when a flock of a dozen or so delighted the dwellers in this locality with their golden-shaded, black and white plumage, flute-like notes, easy and graceful movements. Their home is said to be North-West Canada and some of the Western States. I have not met any one who is acquainted with them or who has ever seen them in their summer residences. I believe the HORTICULTURIST is now read in almost every town and village in the Dominion, and, doubtless, some of its readers can give us some information regarding these interesting visitors; that is the reason I write this letter.

These birds are remarkably social, seldom parting company more than a short distance, nearly free from timidity, and happy as the "Blue Jay." While sojourning here, their food was chiefly the buds of evergreen trees, for the clipping off of which their ponderous beaks are peculiarly adapted. When I found they had cut off nearly every bud from some of my Norway spruce trees, I felt thankful their visit was not prolonged. I hope they have other food than buds when in their native *habitat*. When the Pine Grosbeaks visit us they eat

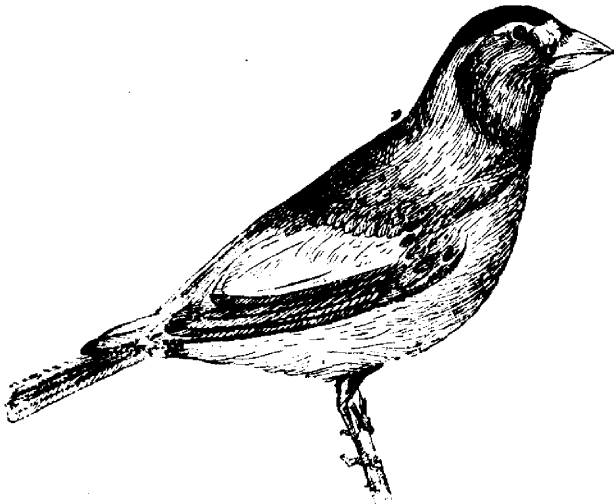


FIG. 546.—EVENING GROSBEEK.

tree seeds and Mountain Ash berries, and have not been noticed eating buds ; yet, a close look at their great beaks, leads one to suspect them.

The Rose-breasted Grosbeaks, who make this a halting-place on their journey northward every spring, eat insects, seeds and berries. They are also said to eat buds. They do not come in flocks, however, and any damage they may have done has hardly been perceptible.

Our attention was first attracted to the work of the Evening Grosbeaks by great quantities of bud-covers, or skins, lying on the snow, with which the ground was covered. On examining the trees which had been attacked, we found that even the top bud had been taken off, and that, of course, caused a crookedness in the future growth ; but should these birds ever visit us again, I will spare them on account of the love I have for birds.

Cataraqui, Ont.

D. NICOL.

UTILIZING FRUITS.

A Method for Making use of Surplus Fruits.



THE recent discussion on profitable ways of marketing fruit by the New Jersey Horticultural Society touched a subject worthy of greater consideration. Mr. Parry stated that English jams were offered for sale in Philadelphia, put up in quart jars and marked with prices between 65 to 85 cents. The large profits made by the vendors may be well understood, when it is learned that the preparation consists of about $3\frac{1}{2}$ cents worth of sugar, besides the small quantity of fruit. If managed properly, we could undersell the world on these products, and make a large margin on fruit. It does not require the expensive machinery needed for canning. Every farmer can do it on his own place.

Mr. Rogers said the foreign preparation of jam is superior to most American jams on the market. This makes the market for it ; but there is no reason why American jams cannot be produced in great quantities, and of a quality superior to any produced in England. In this form and manner vast quantities of all kinds of fruits can be marketed in this country, as needed, and prices for "green fruits" kept at higher figures.

Jams can be made of all kinds of fruits and berries, including grapes, and all that is required in order to have them of fine quality, is good and ripe fruits, and how to do it—and any good cook-book, like Marion Harland's, will give all the needful information on this point. Grape jams, properly made, ought to become immensely popular, and sell everywhere, at all seasons of the year, and especially in winter and spring.—Vineyardist.

The Bordeaux mixture, if used too late, causes a russet appearance on both pears and apples.

INCENTIVES TO AGRICULTURAL LIFE UNDER A THREE-FOLD ASPECT.

A Word for Farmers' Sons.



THE great tendency for farmers' sons to seek a life of ease in the towns and cities, and to cultivate a dislike for the so-called "drudgery" of the farm or garden, calls forth earnest effort to try to convince the boys of the mistake they make in exchanging the free, happy, healthy life of the country for the bondage and uncertainties of city life. The ambition to become *great*, and able to lead a life of ease and luxury, is often the snare that is laid to lure many a youth from the quiet steady life of the farm to embark on the feverish existence of a business career that, after it is fretted to the bitter end, closes with bankruptcy, and financial ruin. True this is not the case with every one, but when we consider that it is estimated that only three out of every hundred of those who embark in business in New York city, ultimately succeed in a permanent business prosperity, it seems to show that the general rule is *failure* and defeat in the battle of life, instead of success and victory. Let us view this exodus from the country to the city, by the farmer boys in a three fold aspect. First, as a *financial*, secondly, as a *physical*, and thirdly, as a *moral* argument for remaining on the farm. As a financial success, every one who applies himself to the work of tilling the soil with a fair share of intelligence added to his efforts, and with a practice of economy and perseverance, is sure to have a reasonable degree of prosperity resulting from those efforts, though he may not acquire riches in a short period. But suddenly acquired wealth, often begets luxury and extravagant living, which eat like canker worms into the fancied easy life of its possessor. "Slow and steady gains give competence with tranquility of mind," and let every farmer boy who reads this paper, repeat the above maxim, until it is indelibly imprinted on his very soul and he will find it a profitable item to serve as a balance wheel to his financial desires as long as he is permitted to exist on this mundane sphere. And we say without reserve, that no occupation offers the same prospects for a comfortable competence an ultimate financial success that the cultivation of the soil offers, providing that intelligence and economy are accompaniments of that cultivation. Look carefully over the experiences of the farming and gardening community, and if you find an isolated case of failure you will be able to trace it to some prominent lack of effort in the right direction, perhaps some extravagant habits either by the man out of doors, or the woman within doors, or some want of energy or right application of the principles of success. On the other hand, in the trades and professions, often the most assiduous efforts and careful management result

in lamentable failure, while in the great variety of influences of city life, the temptations to drift into habits of luxurious living, maintainance of style, and other social canker-worms, are far more prominent than in the quiet influences of the country, where the handiwork of a Divine Creator constantly appeals to our administration, and call out our reverence and love.

Tried under the health aspect, surely every one who practices a habit of obstruction will see the decided advantage the country has over the city in that respect. Pure air, wholesome food, and out-of-door exercise in the development of muscular energy, are sure promoters of health, while the calmness of mind and spirit of contentment which generally characterizes the tiller of the soil, presents a strong contrast to the care-worn anxious mein of the business or professional man, who has to cater to the patronage of a capricious public, in order to make ends meet and maintain his prestige in the particular line in which he is engaged. If health and long life, and an easy contented mind are desirable through life, surely the country takes the preference, as all will admit.

Now as to the moral argument of our theme, a simple reference to it would seem to be enough without presenting contrasts, but for the better illustration of our claim we quote a line fraught with deep meaning, thus "God made the country, but man made the town." Surely aimed the entrancing attractions of nature, evidences of the work of a Divine Architect and proofs of His wisdom and love to man, the soul that is at all delivered from self, and that runs out in unison with what it is surrounded, cannot but be impressed with a spirit of adoration and praise, while high and lofty aims and desires for a pure life will be begotten and encouraged, in contrast with the sordid love of gain, and the cunning craft which is ever found in the thoroughfares of business and professional life, to say nothing of the spirit of priestcraft and soul-slavery which so largely abounds in city life.

Think over these things, boys, count well the costs in all its aspects, before you consent to change the life of the farm or garden for the busy mart of the city—Apply yourselves to the study of enlightened agriculture, horticulture and floriculture, and you will have an unceasing range of interest to occupy your time and attention and the so-called "drudgery," of the farm will have no place in your estimate.

L. FOOTE.

Apple better than Orange Culture.—A neighbor who has gone to Florida to raise oranges recently called on us while visiting his old home. Seeing our apple trees with their load of highly-colored fruit he said: "I tell you, say what they may of the beauties of the orange groves, the truth is the orange tree at its best is never more beautiful than the apple tree of New England. The apple in bloom is far ahead of the orange, and when bending to the ground with its load of ruby fruit it is ahead again.—New England Farmer.

A DEVICE FOR UTILISING RAIN WATER WITH MANURE.



Y plan is to take three posts six feet long, six inches square, sink them three feet in ground and place a 100 gallon barrel on them. 1 is a false bottom with small holes in it to allow the liquid to the tap. Nail this three inches from the bottom of barrel. 2 is the manure and water in barrel. 3 is a round floater two inches thick and as wide across as the inside of barrel will permit it to work up and down freely; this floater cannot rise high enough to raise the funnel end of pipe 5, so add the bridge 4 in centre of floater under funnel cross-ways. 4 is made of a stiff wire (bridge shape) and fastened on centre of floater by boring two holes one and one-half inches deep, the size of wire, and fasten the two ends of bridge in them firmly; make this bridge about twelve inches long and high enough to lift the funnel end of pipe 5, when the barrel will be full. 5 is a tin pipe the same length as the width of the top (head) of barrel, so by fastening it with a hinge at centre it will about balance; if not, add anything at either end to balance it. I solder one end of a hinge under the centre of pipe 5, and the other end of hinge I screw on end of barrel. The water falling in funnel makes it sink if the barrel is empty, so the water falls in the barrel. When the barrel is full the bridge on the floater will raise the funnel end of pipe 5, so the water flows in the waste pipe 8, instead of washing the strength from the manure and coloring the outside of barrel, etc. 6 6. are made of stiff wire to keep the floater from turning around, for the bridge should be cross-ways, with

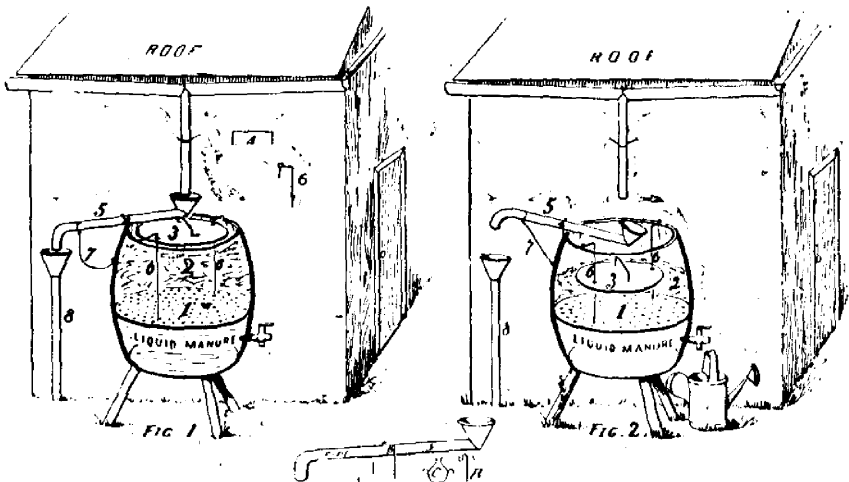


FIG. 547.

pipe 5 under the funnel, so bore two holes in edge of floater twice the size of wire to allow the floater to float up and down freely. I push these two wires one in each hole of floater and through the manure, the upper end of wire having been bent to receive a screw. I fasten one screw in each eye like (6 at right hand of Fig. 1), and in the top of stave of the barrel which is firm enough. 7 is a cord or light chain fastened on end of pipe 5, near elbow and the other on centre (bilge) of barrel to keep the funnel end of pipe from lowering too much in barrel when empty. Before placing the manure in barrel I put two inches thick of oyster-shells on the false bottom in such a manner as to not block the holes.

Fig. 3. represents pipe 5 balanced without a hinge. Take a stiff wire, bend it like a *c* with two eyes for the two support wires *b*, the ends of which are "huck" shape. bore two holes the size of wire *b*, on end of stave of barrel to fit these hucks *b* upright; place your pipe 5 on a balance and tie the two ends of wire *c* tight over pipe 5 at centre.

I use this liquid manure twice a week, sprinkling only the ground, for it colors the leaves. In the fall, before the frost has come, I empty all the liquid into small kegs and put them in the cellar and tap them according as I want some liquid to water my plants in the house twice a week, which I think does them much good.

This device may not answer for a very large and high roof where the water would fall too heavily in the funnel and splatter over the edge of barrel, although it works very nicely with a small or low roof.

Montreal, P. Q.

O. GAGNON.

The Culture of Raspberries.—It is not generally known that the raspberry cane is hardy just in proportion to the amount of healthy leaves which will continue healthful to the last. If the leaves fall before the natural time for leaf ripening, the wood has but a very low vital power, and is very easily killed by the first frost. Every effort, therefore, should be made to keep the leaves of raspberry canes healthy. Small and weak canes, should be kept down, and good manure, or other enriching food applied to the plants. The raspberry is especially fond of cool earth to grow in. It is indifferent to the temperature of the atmosphere, but does not like extra heat at the roots. To this end a mulching of any half-rotten material is an excellent practice in cultivating this fruit. Sometimes, in spite of all precautions, rust will attack raspberry leaves, or some other kind of fungus will make a home on the foliage—the leaves then die early, and the canes are not very strong. Under these circumstances, much profit ensues from bending the canes down and covering them with earth during winter. This prevents great evaporation from the canes, which is the chief source of injury. Early in the season, as soon as the frost is gone, the earth must be taken from the canes, otherwise the buds will push early and rot. With a little care in cultivation, with some such treatment as that described, the raspberry is one of the most successful of amateur grown fruits.—Meehan's Monthly.

GOOSEBERRIES.



THE gooseberry itself is fond of a cool, moist soil, and does best in a climate like that of England, where it has reached the greatest perfection, both in size and flavor. The hot, dry climate here ripens it too rapidly to allow it to acquire this flavor. The English varieties are larger and finer than the American, but have not succeeded here on account of the mildew. Fortunately, we now have a sure remedy for this disease, and when it becomes generally known, it may be that a new era of gooseberry culture will dawn upon us.

SOIL AND CULTIVATION.—A cool, moist, rich soil, full of vegetable matter, with northern aspect, if possible, well manured with compost, is necessary to the best results. But, although the soil should be moist, it should be well drained. The plant will not tolerate stagnant water about its roots, nor in a stagnant soil. It will soon become hidebound and the stems covered with moss. But to secure the necessary coolness and moisture, the ground should be well mulched with well-rotted compost. In making this statement it is intended to aim for the highest results, as I believe more profit will result from this course.

The famous growers of Lancashire, England, outdo the world in producing berries of quality and size. The Encyclopedia of Gardening, says :

“To effect this increased size, every stimulant is applied that their ingenuity can suggest ; they not only annually manure the soil richly, but also surround the plant with trenches of manure for the extremities of the roots to strike into, and form around the stems of each plant a basin to be mulched, manured or watered as may become necessary. When a root has extended too far from the stem, it is uncovered, and all the strongest leaders are shortened back nearly one-half of their length and covered with fresh marl loam, well manured. The effect of this pruning is to increase the number of fibres and spongioles, which form rapidly on the shortened roots, and strike out in all directions among the fresh newly-stirred loam in search of nutriment.”

PRUNING.—The gooseberry produces fruit buds and spurs on wood two years old and over. Patrick Barry says : “The bush should have a stem of three or four inches in height and a head composed of five or six main branches, placed at equal distances, and inclined outwards to prevent denseness and confusion in the centre. These main branches should be furnished with bearing wood in all their length. The production of such a bush may be accomplished by the following means :

Supposing the young plant as it comes from the nursery to be either a two-year old cutting or a one-year bedded layer, in either case it will have a stem of

two or three inches at least, and a few branches at the top. Before planting, all the buds on the part of the stem to be under ground should be cut out to prevent them from producing suckers. Among the branches, three of those most favorably situated are selected for the formation of the head, and the others are cut out entirely. The reserved branches are then cut back to two or three buds; from these one shoot is taken on each branch and the others are pinched to favor this. By this method we shall have three stout shoots in the fall; if the plant had been well rooted instead of being newly transplanted, we might have taken two shoots instead of one from each shortened branch. These three branches are cut back at the next pruning to three or four buds, and from each two new shoots are taken, giving at the end of that season six stout shoots situated at equal distances. At the next, or third, pruning, these branches are cut back about one-half in order to produce lateral branches and fruit spurs. At the fourth pruning, the leading shoot is shortened one third or one-half; any lateral branches not required to fill up spaces, or such as are improperly placed, are cut back to three or four buds, so as to convert them into fruit branches.

In this way the pruning is conducted from year to year. When the plants become feeble from overbearing, the fruit branches may be headed down and replaced by vigorous shoots. The better way, however, to provide for the difficulty is to raise young plants from layers, to be at once substituted for those that fall victims to mildew.

FROM statistics gathered by the American Cranberry Grower's Association it is learned that in 1883 Wisconsin produced 135,507 bushels; in 1884, 24,873; in 1885, 264,432 bushels; and in 1886, 70,686 bushels of fruit. By these figures it will be seen that the yield is very irregular. This is owing, principally, to the fact that many of the marshes are not yet provided with the means of flooding, and, of course, suffer from worms, drouths, late spring or early autumn frosts, and extensive fires started by sparks from the engines on railroads running through the marshes. These and other evils are averted on the more improved farms. So that while handsome fortunes have in many cases been made in cranberry growing, many thousands of dollars, have on the other hand, been sunk in the same industry. Only the wealthier owners, who have expended vast sums of money in improving and equipping their property, can calculate with any degree of certainty on a paying crop of fruit every year.—American Magazine.

Spraying with fungicides in the season of 1892 prevented much of the early dropping of apples, which is usually attributed to wet weather.

For apples, two applications of Bordeaux mixture before blooming are advised, and two of the same mixture after blooming, with Paris green added.

Early spraying is the key to success in the use of fungicides.

PRUNING TREES.



ANY trees suffer from excessive pruning; while as many probably fail to meet the results anticipated by cultivators, through a want of pruning. No one can be taught how to prune properly, unless the object to be attained by such pruning is clearly kept in view. The student of this practical horticulture, coming into Philadelphia by the Pa. R. R. may see an admirable lesson in this line from the large forest trees in the vicinity of the Zoological gardens. These have evidently suffered at some time or another from starvation. In natural woods, trees receive a great deal of food from the decay of fallen leaves which accumulate beneath them; this collects sand and other mineral matters, and forms an excellent opportunity of giving food to the roots. When the surface is kept clear, as it ought to be kept clear for popular enjoyment, the trees have no opportunity of getting the nutrition necessary to sustain a vigorous hold on life. When a dry season comes of extra severity, or an extra severe winter is experienced, the vital power being low, large branches get weak, or in many cases, nearly die. In the illustration we have above referred to, these trees simply had the heads cut off. The trees were, in common language, polarded; but the branches shot out with little more vigor than before, because the trouble was not this excess of branches, but the deficiency of food. As a consequence, the stumps are rotting away at the centre, and it will not be many years before these fine specimens of the ancient forests of Pennsylvania will disappear. If a large amount of surface manuring had been applied instead of heading off the trees, it would have been a life-saving, instead of a life-destroying, operation. It will be seen then, that the object for which we prune must be first considered before pruning is resorted to.

In connection with orchard trees, the same thoughtfulness before commencing to prune is required. It is essential that a tree should have a large amount of healthy foliage rather than the same quantity of half starved leaves, Branches in the interior of the tree, bearing only half shaded or weak leaves, are of little use. If these are taken out, the vital energies are directed into the healthier branches, which are made still more healthy, and give good results. But it may be that the trees have been allowed to overbear and the larger branches have had their life-principle somewhat exhausted. In such a case, instead of pruning out the younger branches in the interior, it is better to cut away the larger and somewhat exhausted ones and leave a younger race of shoots to take their place. These illustrations are given to show that the whole question of whether pruning is or is not an advantage, is wholly dependent on the object which it is attempted to gain, and this can only be answered by the facts in each individual case.—Meehan's Monthly.

"SPRAYING VS. JARRING" IN PREVENTING THE ATTACKS OF THE CURCULIO.



OPINIONS in regard to the relative merits of "spraying" or "jarring," in preventing the attacks of curculio, are exceedingly varied, and, I think, always will be. This is owing to the fact that some growers have the apparatus for spraying advantageously and quickly, and have become accustomed to this method of fighting the "little Turk," and so do not care to change their appliances and ideas to suit any other method. The same is true in regard to those who claim that the cheapest and best method of fighting the curculio is by the older system of jarring.

I am not in a position, from personal experience, to speak more in favor of one than the other. I notice, however, in a recent symposium in the Rural New Yorker that while opinions seem to be pretty well divided, yet the majority, including Professor Cook, an eminent entomologist, of Michigan, inclines to the belief that better results can be obtained by jarring.

Those who decide to jar should not forget, however, that their trees must be first headed high enough to allow of easy approach by the operator of the umbrella-like device arranged to catch the falling curculio.

A system of close pruning or heading-in must also be practised in order to keep the top of the tree within moderate bounds.

Some interesting facts on the subject came into my hands last season as the result of careful experiments conducted by Mr. R. B. Blake, of Cedar Springs, Ontario, which I deem of sufficient value to give to the public through the medium of the CANADIAN HORTICULTURIST. Now that growers not only can, but should, spray to prevent the peach and plum rot, and owing to the fact that Paris green may be safely added to the Bordeaux mixture, which may be considered a partial remedy for the peach and plum rot, it would seem that spraying would be the more easily applied and prove the cheaper remedy of the two.

Mr. Blake, writing me last August, says: "I have one row of 36 Early Canada's: I started to jar them as soon as the little white peach got free from the blossom. The following are the results for 12 mornings:—Off the 36 trees first morning I collected on sheets, 198. This seemed to be too long a job to continue, so I dropped 26 and kept on with 10 trees only, for the next eleven days. Second morning, collected and destroyed 49; 3rd morning, 69; 4th morning, 75; 5th morning, 82; 6th morning, 36; 7th morning, 53; 8th morning, 47; 9th morning, 89; 10th morning, 68; 11th morning, 84. At first not a peach had been stung, but as I went on I found they had been attacked, and

began to see the uselessness of this method. I then sprayed the 10 trees with Paris green, with the astonishing result, that not one peach ripened on the whole lot of 36 trees; at one time it looked a bushel a tree. I looked at the clock each time I went to jar, and on returning found the 36 trees took two and one-half hours, and the 10 ran from 45 minutes to an hour each time, so that you may see that for a large orchard this method is quite impracticable.

I sprayed the whole of my other peach trees with Paris green at the rate of one pound to 300 gallons of water, with the addition of four pounds of lime to each coal oil barrel of water (say about 44 to 45 gallons.)

The first spraying did not effect the foliage in the least, as rain came soon after. I gave them all another spraying, and this did not seem to hurt them. I gave a third spraying to a portion, and this time the leaves were scorched badly, the peaches of some trees tumbled off, but at this time nearly all seem to have fully recovered. But the spraying did not save them, as I lost all my early Canadas, Amsden June, Early Alexander, Early Louise, and I only marketed three twelve quart baskets, and this off trees which at first gave promise of an enormous crop.

I have nine trees of Early Rivers, six of which I sprayed the same strength three times, with no injury on the six. I have twelve baskets nearly ripe, and at present sound, on the unsprayed ones *not a peach*.

The early peaches nearly ripened a great many, but then rotted. On examination nearly, if not quite, all had been stung with curculio.

On the 21st and 22nd July, I caught several curculio at work on nearly full-grown peaches."

The loss of our Blake's early peaches which had been sprayed, was probably due in a larger measure to the effect of plum rot (*monilia*), than to the attacks of curculio, so that a judicious use of Bordeaux mixture and Paris green might have saved the crop. No doubt there is danger of injuring the foliage by repeated applications of Paris green, as there seems to be a slight residue left on the leaf after each application, which is not washed off, and this accumulating with repeated sprayings, finally affects the foliage injuriously. Care should therefore be exercised when making the last application, to see that it is slightly weaker than those made previously.

JOHN CRAIG.

Central Experimental Farm, Ottawa.

WITH peaches, nearly or quite all of the pruning should be done in the spring. There is so much risk of the new growth being killed, and, of course, it will need to be cut out in the spring, that it is best to defer pruning until reasonably early in the spring. The peach needs severe pruning annually—from one-third to one-half of the new growth should be cut out. This will aid materially in securing a better quality of fruit.—*Farm Life*.

❖ The Kitchen Garden. ❖

THE NEW CELERY CULTURE.

The R. N. Y. says: For the benefit of newer readers, we will briefly restate the main features of what is called the "New Celery Culture." The soil is

well enriched and prepared with great care, being made as fine and open as tools can make it. It is then marked off in rows seven inches apart each way. The plants, started as usual from seed, are set out in the cross marks seven inches apart all over the field. They are cultivated with the wheel hoe and hand tools as long as possible, and irrigated or watered so that the soil never becomes very dry.



Mr. Beckwith of the Delaware Agricultural Experimental Station, has tried the new plan and says: We are so well pleased with this method that we shall try it again the coming season, and shall set the plants seven inches apart each way, and make the bed very much wider, as we think by so doing the plants will blanch better.

The above is from a photograph of the celery taken while growing in the garden. The five rows to the right show that planted after the Niven method, while at the left is a row of White Plume blanching by means of boards on each side instead of soil.

Summer Pruning of Gooseberries and Currants.—Of these there are two kinds requiring notice, viz., Gooseberries and Currants, of the latter only red and white varieties, and of the first-named only those trained to walls. Anyone who has not hitherto practised summer pruning as here advocated for Currants and Gooseberries would, I feel sure, after a first trial adopt the plan. The young shoots are cut back about the second or third week in June to within four or five leaves of their base, and it only remains to be said that you will be rewarded by larger fruit and more of it than would be the case if they were treated only to the customary winter pruning.—H. G. H. in *Garden Work*.

* The Apiary *

THE HONEY BEE IN RELATION TO PLANT LIFE.



IT seems almost remarkable that we appear to strive after that which is not within reach, and that which is ours, if we but nod our head, is spurned as unworthy of our notice and of our attention.

What more interesting study can those of us, who live in rural districts, desire than the study of plant and animal life. How many years did I and many others pass in the country, and the things about us were a closed book. And how the first glance astonishes, dazzles and yet delights. Youth can have no greater safeguard except the divine, be it in the country or city, than to become interested in the study of the habits of plants and insects, and the relation the one bears to the other. One so interested would, without doubt, appreciate to a greater extent the advantages, yes, with all its drudgery, the beauties of rural occupations. And youth need not be interested alone; those of us who have reached a mature age will find this a study well worthy of our attention during our hours of comparative leisure, and, withal, we can derive from this study solid financial benefits. I propose to just lightly touch upon the honey bee and its relation to plant life.

To many of us the characteristic of the bee essentially valuable is, that we can, in a manner, domesticate it and turn it to the gathering of surplus honey. But is this the reason we have the honey bee creation, or is the storing of honey only a secondary matter. There is every evidence to show that as in our own lives working for our daily bread is only a secondary matter, and the object of our existence is far above and beyond that, so the object of the existence of the honey bee is primarily not to store honey, but to assist plant life in reproduction. Darwin and a host of others have shown that the honey bee plays no mean part in the reproduction of plant life. Some plants are only partially dependent on insect life for fertilization, others are entirely so. A peep as it were into the plan of nature will be of interest, and perhaps lead to further research.

The parts of a flower are calyx, corolla, stamens and pistils. The calyx is the cup or outer covering of the blossom, and is usually green and leaf-like. The corolla is the inner set of leaves of the flower. It is very seldom green as the calyx commonly is, but is "colored" other than green, and of a delicate texture. It is the most showy part of the blossom. The stamens constitute the male portion of the flower, and are divided into filament and anther. The filament is the stalk, the anther is a little case, or hollow body, borne on the top of the filament. It is filled with a powdery matter called pollen. The pistils



FIG. 548.

are the bodies in which the seeds are found. They belong to the centre of the flower. A pistil has three parts, at the bottom is the ovary which becomes the seed vessel. This is prolonged upward into a slender body called the style. And this bears a moist, generally somewhat enlarged portion, with a naked roughish surface (called the stigma) Upon this stigma some of the pollen, or powder from the anthers, falls and sticks fast, and thus somehow enables the pistils to ripen seeds that will grow. A perfect grower contains both stamens and pistils, but we find some plants with stamens only and others with pistils only, and then two may be borne by the same plant and

blossom. Sometimes a blossom bearing both stamens and pistils cannot fertilize itself, as the two mature at different times preventing self fertilization.

Sometimes the stamens and pistils are arranged in different positions in the flower. The stamens and pistils always, being different lengths in each flower, the honey bee, when taking the nectar, gets dusted with pollen on the head, thorax or abdomen, according to the height of the stamens, and when the bee visits other flowers, in which the relative position of the pistil is similar, the pollen comes in contact with the stigma, thus bringing about cross-fertilization. The same effect is brought about by many other devices. This is an excellent provision of nature, just as the queen is not fertilized in the hive, but flies out on the wing to prevent the likelihood of impregnation with a drone of her own blood. Again we know in the reproduction of stock on the farm, in and in



FIG. 549.



FIG. 550.

breeding can not be followed to a great extent or the progeny lacks in vigor and is otherwise defective; this rule applies equally well to plant life. It is desirable that the pollen from one flower be taken to the stigma of another, instead of the pollen and stigma from the same flower coming in contact. There are very many varieties in which we find the anthers and pistils maturing at different times. The garden nasturtium (Fig. 548 and Fig. 549) is an excellent example.

Here the nectar is contained in a long spur. When the flower first opens, the style is short and the stigma immature and unreceptive, the anthers also are quite unripe, but soon

one or two, as seen in Fig. 549, begin to rise from their first position beneath the flower until they stand just over the stigma, so that a bee entering could not fail to get dusted in the breast with pollen (now beginning to be shed), as the tongue is stretched out, and the head pushed forward to reach the sweet secretion in the spur.

The anthers, continuing to reach maturity, follow their leaders, one by one, and during the time that their pollen is being liberated by gaping of the pollen pouches, they stand in front of or close to the stigma. This process occupies from three to seven days, after which the anthers begin to drop off, and the filaments to shrivel and droop.

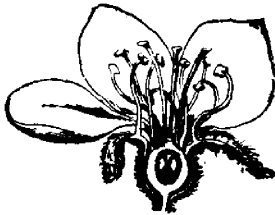


FIG. 552.

But the style meanwhile has grown longer, and the pistil, now adhesive and receptive, assumes the position in relation to the rest of the blossom, which the anthers before occupied (see Fig. 551). A bee flitting from flower to flower, loading her legs with pollen and her honey sac with nectar, passes, with a well powdered breast, from the younger condition (Fig. 549) to the older (Fig. 550), and of necessity presses the pollen grains she carries on to the stigma, and cross fertilization is accomplished, the only possible fertilization since the two genders do not co-exist, the blossom during the latter period being only female.

It is well deserving of notice that the three lower petals (one of which has been removed in the figure) have their edges cut into a number of narrow slits which are turned so as to stand nearly upright. These refuse contact with water, and perfectly protect the nectar from dilution by rain, as may be easily seen by sprinkling water heavily upon one of the flowers; they also compel the visiting insect to keep the thorax sufficiently up to rub off its load pollen upon the stigma.

Looking at the blossom now in the front, we see the lines on the several petals according to a beautiful and general law in the floral world, point to the cavity in which the nectar lies, so that these beautiful lines are guides to the insect visitor.

The order of development noticed in the blossom just passed is sometimes, though far less commonly, reversed, as in figwort (Figs. 550, 551 and 553), which is a great honey plant. The flower is both male and female, but as before, the two genders are never actually co-existent. In this case the stigma is first mature. When the corolla opens, the stigma

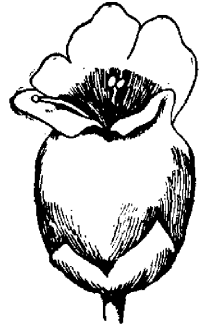


FIG. 551.



FIG. 553.

already adherent and receptive, presents itself immediately over the front lip (Fig. 550), and bees—having been dusted by pollen in their visits to older flowers, and in a manner we shall presently see—as they reach in after the abundant nectar, transfer this pollen from their hairy breasts to the sticky surface of the stigma. Cross fertilization having been secured, the stigma shrinks and dries, and the style droops, while the anthers, which previously had been hiding in the pouch like form given to the front of the corolla cup for their accommodation (see Fig. 550), now rise in view (Figs. 551 and 553), take the place whence the stigma has retired, and begin to shed their pollen.

The anthers completely occupy the space over the lip, arranging themselves in two parts, so that, in getting the nectar, the bees must reach across if the flower is approached in front, whilst the height of the back lip is such that it is impracticable for them to steal the honey from behind.

As the fertilizing dust is carried off for the benefit of the younger blossom, the yield of nectar diminishes, and the corolla cup at last drops. There are other blossoms in which male and female parts mature at the same time, but the female are so arranged that an insect visiting them would come in contact with the female part first, thus securing cross fertilization if the bee carries the pollen from another flower, which is extremely probable. We have another set of flowers in which the male and female organs are in one blossom, but in some the anther is most exposed, in others the stigma. In these the blossom is able to fertilize itself, but experiment has shown that, to secure the best results, cross fertilization is desirable, and also that pollen, placed on the stigma of the flower from whence it has been derived, would be rendered powerless by subsequently adding pollen from the complementary blossom.

In clovers the stigma first touches the bee's body, so that crossing is brought about. In the leguminosæ, this arrangement prevails; the pollen from the last flower visited fertilizing the next. Since Darwin many scientists have made abundant tests and experiments confirming this conclusions. Practical men have by observation confirmed the same. They notice a scarcity of insect visits to the blossoms of the first crop of red clover and its failure to bear seed. Alsike clover is freely visited in June by the honey bee, and bears a crop of seeds.

In New Zealand the red clover failed to seed at all seasons, and there was a marked absence of insects upon the blossoms. This led to the importation of bumble bees, our honey bee not having a tongue long enough to reach the honey in red clover; and now in New Zealand farmers produce clover seed. I have had gardeners purchase a colony of bees that their vegetables might fruit more liberally, and one gave an order for a colony to put right in his green house for cucumbers, finding that to be the easiest and cheapest method of securing perfect fertilization. We have all noticed if there is rain and cold all through fruit bloom, the trees are almost sure to bear sparingly.

Prof. Cook conducted a series of experiments bearing upon the importance

of insects in the pollenisation of plants, he states: To determine this point I tried many experiments last spring. I counted the blossoms on each of two branches or plants, of apple, cherry, pear, strawberry, raspberry and clover. One of these in care of each fruit or each experiment, was surrounded by cheese cloth, just before the blossoms opened and kept covered till the blossoms fell off. The number of blossoms considerably varied from 32 the smallest, to 300 the largest. The trees were examined June 11th to see what number had set. The per centage of blossoms which developed on the covered trees was a little over two, whilst almost twenty per cent of the uncovered blossoms had developed. Of the pears not one of the covered developed, while five per cent. of the uncovered developed fruit. Of the cherries three per cent. only of the covered developed, while forty per cent. of the uncovered blossoms set their fruit. In the strawberries eleven per cent. of the covered, and seventeen per cent. of the uncovered had developed.

In clover, white and alsike, the uncovered were full of seeds, the covered had none at all. The apple carries five stigmas (Fig. 562). To each stigma belongs a division of the compound ovary constituting the core of the fruit. The stigma comes to maturity before the anthers. Bees seeking nectar get dusted completely, and then transfer the granules to the stigmas of neighboring blossoms.

The apple is strictly a fusion of five fruits into one, and demands for its production in perfection, no less than five independent fertilizations. If none are effected the calyx, which forms the flesh of the fruit, instead of swelling, dies and drops. An apple often develops, however, though imperfectly, if four only of the stigmas have been pollen dusted; it rarely hangs long enough to ripen, the wind storms shaking them off. Their fruit may be generally known by a deformity, one part has failed to grow because there has been no diversion of nutrition towards it. Cutting it across with a knife, we find the hollow cheek lies opposite the unfertilized division, containing only shrivelled pips. Gooseberries are absolutely dependent on insect life for fertilization.

R. A. Grimshaw, in the *British Bee Journal*, says cross fertilized cabbage plants produced seeds, the plants from which flowered earlier than those from uncultured seeds; they were five per cent. taller; cabbage plants from crossed seeds were three times as heavy as those from uncrossed seeds. All round, heights, weights and fertility of crossed common cabbage were five times those from uncrossed seeds; common pear as one hundred to seventy-five. With our vast orchards and amount of bloom, we have really an artificial condition in plant life; and with the busy bee we secure an artificial condition in insect life. The honey bee is not a native of our country. In the honey bee we have an insect which does not injure fruit as so many others do; her visits are to bless. Much more could be said, but I feel sure enough has been said to show that bee-keeping and horticulture has much of common interest, and that the honey bee, although she produces one of the most wholesome of foods, has a great value to the horticulturist. Many bees may survive the winter, but few other insects do. The spring of the year is the time when these insect visits are mostly required.

Brantford, Ont.

R. F. HOLTERMAN.

THE TINY INSECTS INDISPENSABLE TO FRUIT GROWERS.



R. FRANK BENTON, in *Insect Life*, takes up the question that bees are indispensable to fruit growers as follows: Bee keepers have never complained but that the growing of fruit in the vicinity of their apiaries was a great benefit to their interests, hence their position has been merely a defensive one, the battle waxing warm only when poisonous substances were set out to kill off the

bees, or when fruit growers sprayed their orchards with poisonous insecticides during the time the trees were in blossom, or again when efforts were made to secure, by legislation, the removal of bees from a certain locality as nuisances.

Fruit growers first relented when close observation and experiment showed that wasps bit open tender fruits, birds pecked them, they cracked under the action of the rains, and hail sometimes cut them, bees only coming in to save the wasting juices of the injured fruit. The wide publicity given to the results of the experiments made under the direction of the United States entomologist, and published in the report of the Commissioner of Agriculture for 1885, have no doubt contributed much to secure this change among fruit growers. But now it would appear that the bees have not only been vindicated, but that in the future fruit growers are likely to be generally regarded as more indebted to bee keepers than the latter are to fruit growers, for the amount of honey the bees secure from fruit blossoms comes far short of equaling in value that part of the fruit crop which many accurate observations and experiments indicate is due to the complete cross-fertilization of these blossoms by bees. The observations and researches of Hildebrand, Muller, Delpino, Darwin and others, as



FIG. 534.—DRONE.



FIG. 555.—QUEEN.

well as the excellent explanation of the subject in Cheshire's recent work have gone far to prove how greatly blossoms depend upon the agency of bees for their fertilization and hence for the production of seeds and fruits. The facts they have brought forward are gradually becoming more widely known among fruit growers and bee-keepers, and additional evidence accumulates. A case illustrating very clearly the value of bees in an orchard has recently come to the notice of the writer, and its authenticity is confirmed by correspondence with the parties named, who are gentlemen of long and extensive experience in fruit growing, recognized in their locality as being authorities, particularly in regard to cherry culture. The facts are these.

For several years the cherry crop of Vaca Valley, in Solano County, Cal., has not been good, although it was formerly quite sure. The partial or complete failures have been attributed to north winds, chilling rains and similar climatic conditions, but in the minds of Messrs. Bassford, of Cherry Glen, these causes did not sufficiently account for all the cases of failure.

These gentlemen recollected that formerly when the cherry crops were good wild bees were very plentiful in the valley, and hence thought perhaps the lack of fruit since most of the bees had disappeared might be due to imperfect distribution of the pollen of the blossoms. To test the matter they placed therefore several hives of bees in their orchard in 1890. The result was striking, for the Bassford orchard bore a good crop of cherries while other growers, in the valley, who had no bees found their crops entire or partial failures. This year, (1891) Messrs. Bassford had some 65 hives of bees in their orchard, and Mr. H. A. Bassford writes to the Entomologist: "Our crop was good this season, and we attribute it to the bees." And he adds further: "Since we have been keeping bees our cherry crop has been much larger than formerly, while those orchards nearest us, five miles from here, where no bees were kept, have produced but light crops."

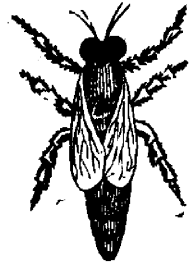


FIG. 536.—WORKER.

In conclusion we may say, that in the cuts we give, the worker bee alone causes the fertilization of bloom. The queen is the mother bee, the drone, the male and the workers are the neuters who gather from honey flowers.

It often happens that alongside the edges of shrubbery and plant borders, and by the margins of flower beds the grass gets killed out by over-spreading plants from the beds; the best way to mend these is by resodding. If you rooted out any tree stumps or rocks in your lawn a year or two ago, there will likely be a hollow there now; if there is, skin off the sod, and fill up the basin enough to make it even with the rest of the lawn, and relay the sod again. If there are any big weeds in your lawn like mulleins, docks, chicory, dandelions, pull them out by the root some wet day. If mouse-ear chickweed, common chickweed, creeping spenwell or the like fill patches of your lawn, scratch them out with a steel rake, and at once sow some grass seed there. Wild onions are always in a hurry up in spring, in wet weather you can pull them up by the roots in bunches; at any rate, take a sharp scythe and go over your lawns and fields mowing down these onions before you turn your cows out to pasture, else they will have onion-tasted milk.

In pruning peach trees they should be headed low. Sufficient cultivation should be given to keep the soil reasonably clean and in good tilth.



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Notes and Comments.

MOTH DESTRUCTION is the subject of a paper read before a New Zealand Society, an extract from which is sent us by Mr. A. Gaviller, of Hamilton. The plan recommended was burning a lamp, which had movable wings covered with castor oil. Underneath was a pan of kerosene, into which the moths fall in large numbers. The whole concern is so made that it may hang up in any tree, and the writer thinks that two such lamps would clear a whole orchard of moths. He caught 2,000 or 3,000 various sized moths in a single night with this apparatus, each of which he supposes would have laid about 500 eggs. He, therefore, calculated he had been the means of destroying 1,250,000 worms in a single night.

BANANAS FOR THE TABLE.—There are many varieties of bananas, and the biggest and handsomest are not always the best for eating; indeed the smallest size are usually the sweetest and juiciest, the tiny Fig banana being the best of all. Large ridges indicate coarse fruit. The Plantain, which is the coarsest variety, has enormous ridges, and is not fit to eat without being cooked. Boiled till soft, the banana is a fine vegetable. When roasted or fried, they should be eaten hot, but when used in this way they should not be too ripe.



❖ Question Drawer. ❖

Ink for Zinc Labels.

571. SIR,—May I ask what kind of a pencil you use on the zinc labels attached to the trees you send out; or do you dip the zinc in some chemical that makes the writing show so plainly?

BENJAMIN BUCHANAN, *Farmingdale, Ill.*

Answer by Mr. John Craig, Horticulturist, Ottawa.

The names were written with zinc label ink, made according to the following recipe:

Sulphate of copper,	1 OZ.
Sal ammoniac,	10 OZ.
Lamp black,	1/2 OZ.
Water,	1/2 pint.

This writing fluid I have used for several years and find it an exceedingly satisfactory means of preserving the names of the different varieties of fruits in an orchard.

Diseased Rose and Violet Leaves.

575. SIR,—I enclose a leaf, please tell me what the insect is on it. I said red spider, but was told it was not.

F. TOBIN, *Fergus.*

Reply by Mr. John Craig, Horticulturist, Central Experimental Farm, Ottawa.

The rose leaves seem to be affected by an attack of the red spider. This insect flourishes in a dry atmosphere, and, therefore, one of the best remedies is to frequently syringe the plants with water. Sulphur fumes are also effective. Pyrethrum mixed with water may also be used with good results. The violet leaf seems to be affected with some sort of mildew, which I do not recognize. The best advice that can be given is to pick off and destroy the diseased leaves.

❖ Question Budget ❖

(For our readers to answer.)

27. **BLenheim ORANGE.**—What is the value of the Blenheim Orange apple, commercially? How does it compare with the Northern Spy for productiveness?—A. S. D., *Seaforth.*

28. **PLUM KNOT.**—In the vicinity of Collingwood, thousands of plum trees are dying of black knot. Could you say any thing concerning its ravages in other sections?—J. D., *Clarksburgh.*



NIGHT BLOOMING CERUS.

THE above cut of the Night Blooming Cerus has been kindly loaned us by Mr. T. W. Elliot, of the Elliot Engraving Company, Toronto. It represents this beautiful flower as taken from a flash-light photo at eleven o'clock in the evening.

* Our Book Table. *

TENTH ANNUAL REPORT of the Board of Control of the State Agricultural Experiment Station at Amherst, Mass., 1892. C. A. Goesmaun, Ph.D., LL.D., Director.

EIGHTEENTH ANNUAL REPORT of the Ontario Agricultural and Experiment Farm, Guelph, 1892. Prof. James Mills, President.

TENANT FARMER DELEGATES' VISIT TO CANADA in 1890, and their reports upon the Agricultural resources of the provinces of Canada. Published by order of the Parliament of Canada.

CATALOGUES.

ANNUAL PRICE LIST OF EVERGREENS, FRUIT TREES, ETC. A. Dawson, Mohawk, Ont.

FRUITS AND FRUIT TREES. Stark Bros., Louisiana, Mo. Well illustrated.

CHAMPION EVAPORATOR. The Grimm Mfg. Co., 67 King St., Montreal, Que.

AMERICAN GRAPE TRAINING.—An account of the leading forms now in use of training the American Grapes; by L. H. Bailey. New York: Rural Publishing Co. 1893.

A neat little book of ninety-two pages, devoted to the more common methods employed by vineyardists in New York State, in pruning their vines. The method which he most favors is the Kniffen, as being best adapted to such rapid growers as the Concord, because it avoids the summer tying, and renders the trellis less expensive. No. 12 wire is advised, unless for the top wire in the Kniffen, which is usually No. 10. The former gives over one hundred feet to every three pounds of wire.

For tying, he recommends raffia as the best. It is obtained from the strippings of an oriental palm, which is usually sold by seedsmen at about 20c. per pound. Wool twine and osier willows are also made use of.

It forms a convenient volume for Canadian grape growers to read and consider. While for ourselves, we prefer the renewal system, there is no doubt that in many instances the Kniffen would prove best adapted.

ANNUAL CATALOGUE. Ertel Improved Victor Incubator and Brooder, manufactured by George Ertel & Co., Quincy, Ill., U. S.

"FACTS ON FOSTITE, a remedy for mildew, black rot, leaf blight, rust," etc. "Magazine Bellows." C. H. Jooster, 3 Coentie's Slip, New York. N. Y.

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Prof. J. Hoyes Panton's M.A.

F. G. S., Bulletin lxxxvii. Issued by the Department of Agriculture, contains much useful information. In it Prof. Panton mentions the utility of

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