

The Canadian Bee Journal

Devoted to the Interests of Bee-Keepers

Vol. 16, No. 9. **September 1908** \$1.00 Per Annum



*The Apiary of
H. A. Smith, Palermo Ont.*

Apiary of H. A. SMITH, Palermo, Ont.

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The Canadian Bee Journal

Devoted to the Interests of Bee Keepers

JAS. J. HURLEY, EDITOR

Published monthly by

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Sept. 1908

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Vol. 16, No. 9.

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The Canadian Bee Journal

PUBLISHED MONTHLY

Vol. 16, No. 9.

SEPTEMBER, 1908

Whole No. 523

Mr. F. Dundas Todd, writing in *Gleanings*, page 941, says: "The best way to open one's eyes is from the rear." This is an epigram deserving of a place among the immortal classics. Again: "I have always found a wrong theory more useful than no theory at all." Good! The persevering, thinking man who follows a wrong theory will soon discover the correct one. It is those who follow no theory at all who make no progress.

* * *

The photo of apiary appearing on our front cover this month is part of the apiary of forty-five colonies of H. A. Smith, of Palermo, Ont. He reports that they did fairly well this season, one colony giving 220 pounds of honey, others giving all the way down to forty pounds. The colony giving 220 pounds is a pure Italian. The poorest colonies are all Blacks. He reports honey as extra fine, all from clover.

* * *

This is perhaps the last issue of the C.B.J. that will reach our readers in time for perusal before the meeting of the U. S. National Association, which meets in Detroit on October 13, 14 and 15. We hope a large delegation of Canadian bee-keepers will attend. The sun palace of the Wayne Hotel, where the Association convenes, is a large room forty or fifty feet across. The sides are of glass and present a beautiful view in the distance. It is an ideal place for such a convention, and we venture to predict that those who attend will not regret it. Secretary Hutchinson has been indefatigable in his efforts to make this convention a success. Insofar as its Secretary is concerned, it deserves success. The indications are that there will be a considerable exhibit of

apicultural appliances, for which some prizes will be offered. Let there be a large turnout from Canada. We are assured of a good welcome.

* * *

A writer in the *Bee-keepers' Record* (British) recommends what he calls "carbolic-camphor" for subduing bees for easy handling. It is easily prepared in the following way: Into a 4 oz. bottle put 1 oz. of carbolic acid in crystals (i.e., pure phenol), and add to this 2 oz. of camphor broken up into little pieces. Immediately they come in contact the two solids begin to run into a liquid, and in a few minutes, with a little shaking, the entire mass will be converted into a clear liquid, having a rather pleasant smell, in which camphor predominates. A few drops of this liquid sprinkled on a sheet subdues the bees in a wonderful manner. There is still another use to which it may be put. Two drops in a tumblerful of water used for cleaning the teeth constitutes a most pleasant antiseptic, and imparts to breath (in the language of advertisement) "a delightful fragrance."

* * *

We are indebted to Thomas William Cowan, editor of the *British Bee Journal*, and author of the *British Bee-keepers' Guide*, for a prospectus of a new work entitled "Wax Craft." We venture the prediction that this work will fill a long-felt want. The size of the work is crown octavo, and the price is placed at two shillings in paper covers; cloth covers, three shillings. The following is the subject matter of the chapters: Chapter I. is historical; chapter III. treats on wax-rendering, taking up all the various methods for accomplishing this by the aid of the sun, by artificial heat, through the

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medium of steam and hot water. Chapter V. has to do with the subject of refining and bleaching wax, removing impurities caused by the introduction of either mineral or vegetable waxes; commercial waxes, refining, etc. Chapter VI. deals with the adulteration of wax, the extent of it, the adulterants, with a list of the various kinds of waxes other than that made by the bees. Chapter VII. deals with the manufacture of comb foundation; chapter IX. with wax candles and tapers. Chapter X. treats of the technical uses of wax.

* * *

In another column will be found an article on coöperation by Mr. R. Beuhne, of Australia, which we take from the Australasian Bee-Keeper, together with a foot-note by the Editor of that paper. The article will be found interesting in view of what has already appeared in the C.B.J. regarding this subject. The problem is practically the same there as it is here. While coöperation is a most desirable aim, it seems to be beset with difficulties that seem difficult to overcome. The great difficulty as we see it is the fact that there are so many small producers whose crop is uncertain, and the quality of which is not always dependable, who will not associate themselves with such an association. The market, except possibly the larger cities, would be largely influenced by their action.

* * *

Mr. Arthur Lang, in his honey exhibit at the Toronto Fair, is showing a cement combination hive stand, bottom board and feeder, on which he has taken first prize as a new invention. We were very much taken with it. In a home yard it would be an ideal tool. It can be made for a cost of about ten or fifteen cents, and will last a lifetime. The only original cost is to make a pattern, after which any one can, by mixing up the sand and cement, make as many as is desirable. The feeding feature is of prime importance. Feeding can be done any time without disturbing the bees in the slightest degree.

Mr. D. Anguish took second prize on a new invention, being a contrivance for cutting section foundation to exact size with a minimum of time and labor. He had an excellent display of honey and captured thirteen prizes.

* * *

Friend Byer's remarks re honey dew gives us somewhat of a jolt. Without hesitation we would defer to his judgment. It was our opinion that honey dew made its appearance only along about the latter end of August and during the warm weather of September. At least this is the only time we have seen it—hence our warning. If it appears earlier the difficulty is only increased.

* * *

Inspector Byer has found foul brood—or what he calls worse, namely, European or Black brood—in the east part of Northumberland County. He promises to write this matter up for the C.B.J. The C.B.J., as well as the bee fraternity throughout Canada, will be very much indebted to him for this work.

* * *

We had the pleasure of attending Toronto's great exhibition on Friday, the 4th inst. The press men had gathered in large numbers, and were hospitably entertained by the directors at luncheon. The Honey Exhibit was very fine. The honey exhibitors were Messrs. Geo. Lang, Milton; G. E. Johnston, Bracebridge; D. Anguish, Lambeth; Arthur Lang, Woodstock, and E. Grainger & Co., Deer Park, Toronto. The exhibit was in the new Horticultural Building, and was a decided improvement upon its old quarters. The building is spacious and well lighted. We were informed also that the sales of honey were good and good prices obtained. We are a little surprised, however, that a larger number do not exhibit. Possibly it is because the prizes offered are so small. We do not think that the prizes are nearly what they should be considering the amount of time and labor necessary in making an adequate display.

Note

On page 21, in passing the sentence, I am mistaken, my own bees, no crosser than read "many" admit that I had where the bees. On the other hand that could put stinging was that the "cop" that our worth for confessing "hornets"; h

Your remarks stores are, Mr. in the main, I Judging from t received these t though, that m duly alarmed o buckwheat hone my limited exp satisfies me that True, the writer in the spring o were mainly bu winter the yard wheat wintered single colony. A the same in all that some other for loss in the tw the loss was cau abnormal amount that article havin exclusively while t At the yard wher well, quite a lot rested in July, attribute the differ ng the past seas clover honey was excellent, and the brood nests see condition as far as

Notes and Comments

(By J. L. Byer)

On page 287, August C.B.J., in discussing the subject of bees being a nuisance, I am made to say, in referring to my own bees, that they are "probably no crosser than any others." This should read "many" others, as I am free to admit that I have been in many apiaries where the bees were not as cross as mine. On the other hand, have run across some that could put mine to shame as far as stinging was concerned. Have an idea that the "copy" read as corrected, and that our worthy Editor pitied the writer for confessing to the fact of keeping "hornets"; hence the change.

Your remarks re buckwheat for winter stores are, Mr. Editor, quite timely, and in the main, I believe, are quite correct. Judging from the tenor of letters being received these days, am of the opinion, though, that many bee-keepers are unduly alarmed over the idea of having buckwheat honey for stores. Personally, my limited experience with buckwheat satisfies me that bees winter well on it. True, the writer had quite a heavy loss in the spring of 1907, when the stores were mainly buckwheat, yet that same winter the yard having the most buckwheat wintered without the loss of a single colony. As conditions were much the same in all three yards, this proves that some other factor was responsible for loss in the two yards. In my opinion, the loss was caused by there being an abnormal amount of pollen in the hives, that article having been gathered almost exclusively while the alsike was in bloom. At the yard where the bees wintered so well, quite a lot of nice honey was harvested in July, and to that cause I attribute the difference in wintering. During the past season, while our crop of clover honey was short, yet the quality was excellent, and at close of the flow the brood nests seemed to be in a normal condition as far as pollen was concerned.

As far as I know, no honey dew has come in at any time in the season, and I am again going to take chances on wintering the bees on buckwheat honey. As may be surmised by the foregoing, we have had a flow from buckwheat. Not one of those big yields we hear of in regular buckwheat localities, yet by all odds the best we have ever had in our section. As a result our hives are very heavy, and if any extracting has to be done from the brood-nests, the work will only be done in the spring, when we think there may be some of it left that is liable to be hoisted into the supers. By the way, if weather had only been a little warmer, and some rain have fallen, we would have had a buckwheat crop worth talking about. However, we are improving every year. You say, Mr. Editor, that in September "half-filled buckwheat combs are sure to be the receptacles of honey dew." Possibly so around Brantford, but never, I believe, in "our locality." Is it common for honey dew to come in at that date I wonder. The only time I have ever noticed the stuff has been during dry spells in June, July and first week of August. It is an easy matter to tell when bees are getting honey dew, as the stuff is always gathered in the early mornings.

Much has been said in the past regarding foul brood in Ontario, and as a rule the majority of bee-keepers know the disease, and know how to act should the disease break out in their apiaries. These remarks apply, of course, to those bee-keepers who read bee journals and attend conventions; but, unfortunately, there are a lot of bee-keepers in Ontario, as well as elsewhere, who do not take the trouble to either read bee journals or go to conventions. While there may be a difference of opinion as to just how widespread this disease is, it is not the writer's intention to make any comments on this phase of the question, but rather to sound a note of warning for bee-keep-

ers to be on their guard against something worse than ordinary foul brood—namely, European or Black brood. At the last convention of the Ontario Association, Mr. House, of New York State, hazarded the guess that this disease was widespread in Ontario, but I feel positive such is not the case, otherwise its ravages would have proclaimed its presence without any doubt. However, the disease is prevalent in its most malignant form in the east part of Northumberland County. A recent visit to that section has so thoroughly alarmed me as to this serious menace to the industry that I felt prompted, after being advised by the bee-keepers of that locality, as well as by the Department of Agriculture, to write up the symptoms of this disease in the C.B.J. The "symptoms" are so well described by Dr. Phillips that I can do no better than quote him word for word, and in anything I may feel to differ with his statements, as compared with the cases that have come under my notice, to comment thereon: "This disease attacks larvæ earlier than does American foul brood, and a comparatively small percentage of the diseased brood is ever capped. The diseased larvæ which are capped over have sunken and perforated cappings. The larvæ when first attacked show a small yellow spot on the body near the head and move about uneasily in the cell. When death occurs they turn yellow, then brown, and finally almost black. Decaying larvæ which have died of this disease do not usually stretch out in a long thread when a small stick is inserted and slowly removed. Occasionally there is a very slight "ropiness," but this is never very marked. The thoroughly dried larvæ form irregular scales, which are not strongly adherent to the lower side wall of the cell. There is very little odor from decaying larvæ which have died of this disease, and when an odor is noticeable it is not the 'glue-pot' odor of the American foul brood, but more nearly resembles that of soured dead brood."

Whether I did not observe closely enough or not, I could not notice the uneasy moving of the diseased larvæ, as mentioned by Dr. Phillips. Anyway, that symptom is one not likely to be noticed by the novice.

Regarding the odor, while the Doctor says it is not very noticeable, here in Ontario it is very much so. Am at a loss as to what to compare it to, but a fully decayed larva, if lifted out of the cell by a toothpick, smells rank enough to arouse the very dullest set of olfactory nerves. Aside from these minor differences mentioned, the symptoms as described by Dr. Phillips are just as they appear in the outbreak under discussion. The disease spreads so rapidly that I am positive that other means than simply infected honey are causes of infection, and I would advise disinfection wherever possible. It is a common thing to find comparatively strong colonies with all the brood dead—whole combs of unsealed larvæ dead as though a blight had caused instantaneous destruction. The Alexander method of requeening was tried faithfully, and with every colony so treated the time was worse than wasted. The two shaking system generally, but **not always**, effects a cure, but so far it is the only known method that is any good. In another issue will have more to say re this disease, as lack of space forbids me writing more at this time.

A WINTER CLAMP

In Use the Year Round

When I first started working among bees, four years ago, cellar wintering seemed best. But several experiences have convinced me that wintering in clamps is best for cold countries; but the clamps must be made of good material, well painted, and have a good roof to give satisfaction.

In many departments of the farm there is so much that can be used only part of the year. Afterwards it is in the way

Sept. 1908

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or in expensive covering, instead of being some use. This, more than anything else, has influenced me in the fixtures I use for any purpose.

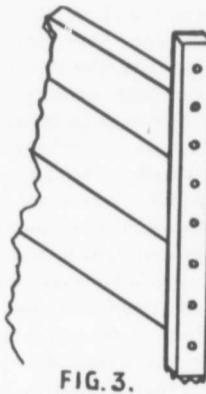
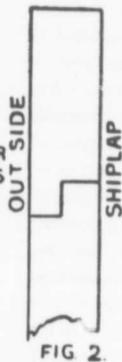
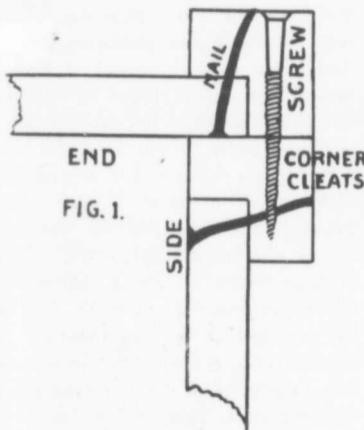
My hive clamps are made detachable and interchangeable. The bottom is 22" x 27" (as in Fig. 3), made by cutting inch board 20" long and nailing inch cleats on the ends. This makes a saving of lumber and makes the board reversible. The bottom board goes on to the ordinary hive standard in winter, and, being off the ground, keeps for a long time.

The body, consisting of four pieces—two sides, a back and front—is made from half-inch shiplap boards (as in Fig.

small inch blocks nailed inside, on which the body rests when in place on the bottom.

The roof is best to be of zinc 30"x24", held in place by four nails entered part way into end corner cleats. A 21"x1" piece keeps up the zinc in the centre. Hives having bottom boards with cleats out to the end of front do away with bridge, a thin board laid on being all that is needed.

These clamps are handy to take out sawdust. The clamp, hive and all but standard, is placed on a large blanket, lid and body carefully raised off, and sawdust falls on the blanket. After the



2), about 4 1/2" wide, so the cracks will not be large through shrinkage. The front differs from the back by being 17" high instead of 18", like the rest of the body, and having an entrance 10" x 3/8" one inch from bottom.

The side boards are cut 26" long and the back and front 23" long, held together by inch-square cleats, with a corner 1/2 square taken out of it for boards to go on. This gives (as in Fig. 1) a finished appearance, as the nailing is done from inside. When completed they measure 24" and 27" respectively. The four pieces are fastened at corners (as shown in Fig. 1) by two screws to each corner to give it rigidity. Each side has

hive is cleaned of sawdust it can be immediately placed on standard. The zinc is put on the bottom board of the clamp and forms lid and shade board, doing away with lids. A stone will hold it in place.

Now, all that is left is the four pieces of the body, which can be used to fit in for the sides of a building to work in and to put in the sawdust. The clamps from twenty-five colonies will make a building 14'x10' and 6 ft. high. A cheap roof of boiled linseed cotton will answer first-rate. Thus everything is of use the year round.

WM. A. LISHMAN
Cayuga, Ont.

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IS WAX DIGESTIBLE?

Dr. G. Bohrer Says No

[American Bee Journal (August)]

On page 749 of Gleanings, for June 15, 1908, under the heading "Stray Straws," the following language is used:

"Sometimes the objection is made to comb honey that the wax is indigestible. Probably in no case does that do any harm, and, in some cases, the indigestibility of the wax is its greatest recommendation. In cases of chronic constipation comb honey has been reported beneficial when extracted would have no effect."

Please permit me to state in reply to the language above quoted that the fact that wax has been reported beneficial in possibly some cases proves beyond a doubt that it acts as an irritant. For to no other property can its possibly beneficial effects be attributed in cases of constipation. Wax never was, is not now, and in all probability never will be, classed as even a mild laxative, to say nothing about it as a cathartic proper. And for the very prominent reason that it acts as an irritant instead of acting as a stimulant proper, it should be avoided by all persons whose digestive organs are sensitive, easily irritated, and excited until abnormal action. Hence to assert, as the writer quoted does, that probably in no case does it do any harm, is not in accord with any standard author upon the subject of digestion, its causes and treatment. Neither is it in harmony with the observations and experience of our older and most scientific practitioners of the healing art.

I remember quite distinctly that when actively engaged in the practice of medicine, several cases of cancer of the stomach came under my care. Among other articles of food as mildly non-irritating as I could advise honey, free from comb or wax, was recommended. And as a matter of taste as to looks, honey in the comb was tried, and could not be borne

by a cancerous stomach, and when the extracted was submitted, it was quite well borne.

And while upon this subject I desire also to state that it is a well-known fact that occasionally a person is found who cannot use honey in the comb as food, it being almost certain to induce spasmodic colic, which in all reasonable probability is caused by the poison that bees invariably expel upon the slightest jar or disturbance of the hive. Only a very few persons are susceptible to the influence of the small amount of bee-sting poison thus scattered over the combs. And when the cappings are removed preparatory to extracting, the poison is almost, if not entirely, removed, leaving the bulk of honey free from this source of irritation to persons peculiarly susceptible to its effects. And if the limited amount of honey obtained from the cappings be kept separate, it can easily be fed back to the bees, and need never be put upon the market.

Permit me to state that in what I have above given as facts I have done no guessing, but have used my best endeavors to give actual statements, which, it is to be hoped, all are in search of, and which can bring no harm to the sale of the products of the bee industry. But, on the contrary, with the increase of a true knowledge of the fact that honey in the extracted form is in its highest, purest and best shape for food, and that under the strict enforcement of the pure food law, and the known fact that more honey can be produced in the extracted form, and that pure honey, free from all sources of irritation to the human digestive organs, is by all odds the most wholesome sweet ever used by man, the sale of honey will increase beyond any demand heretofore known.

Before dismissing the subject, it is but proper to say that many persons do use as food articles not in harmony with the known laws of health, and for a time sustain no apparent injury. But, as a rule, in time it will bring about disastrous results. Men use intoxicants to excess

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Editor Canadia

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through a long life, while very many others fall victims to their effects in a very brief period of time. And so it is with beeswax. It may be, and no doubt often is, eaten without any apparent evil consequences, but the tendency is in the opposite direction. But if it is known to be beneficial in obstinate constipation, one good-sized pill will answer for use in a whole family for a lifetime, for the digestive organs will not in any manner disqualify it for future and perpetual use.

G. BOHRER.

Since the above was put in type we have received the following direct from D. Bohrer, for which we wish to express our thanks:

Editor Canadian Bee Journal:

In your issue of May, 1908, the food qualities and the matter of digesting beeswax are discussed at some length. Please permit me to state that it is wholly indigestible and possesses no food or nutritious properties that are available to the human system. Digestion goes on between 70 and 100 degrees of heat, hence the impossibility of melting beeswax by the heat of the human stomach. And even if melted, the acids of the stomach will not act upon it, nor will any of the most powerful acids known to science act upon it. In fact, any acid can be corked in a bottle with it quite as successfully as with a glass stopper. As a laxative or cathartic remedy it possesses no properties whatever beyond what it may do as any other indigestible and irritating substance will do. For let it be understood that the digestive organs possess the natural power to make an effort to expel any indigestible and non-assimilable substance from the system, and invariably do so. Almost all articles of food used by mankind are combined with matter neither nutritious nor capable of being assimilated, but are expelled from the system by the eliminative organs. But the substances with which they are combined when taken into the stomach

are soluble, and are acted upon by the acids of the digestive organs.

In short, beeswax is the storage room of the hive, and also furnishes the room in which to rear the inmates of the hive, but when put on the table as food it is simply to honey what face powders are to the complexion—ornamental.

All this discussion has, it seems to me, grown out of the matter of advertising honey as a wholesome sweet; and I will state, fearless of successful contradiction, that pure honey is the most wholesome sweet ever used by man, but when used in connection with wax as food it is not pure and imposes upon the digestive organs a tax in the way of extra labor that they often do not bear well.

But by all odds the worst abuse to which honey has ever been subjected, and which has done more to drive it out of the markets of the world, has been in combining it with glucose in order to make that unwholesome and unsalable, as well as largely indigestible, article salable. Since the pure food laws of the United States, and of the different States, have been enacted, it is seldom, if ever, combined with honey, for in this shape, and under a label showing such combination, it will not sell. It is now, as a rule, I think, combined with cane syrup in about the proportion of 90 per cent. of glucose and 10 per cent. of cane syrup. The cunning dodge of calling it corn syrup instead of calling it by its true name, by which the people have always known it, is used to disguise it and to deceive the public. Then let us rigidly enforce the pure food laws and teach the people what glucose is, and also tell them the whole truth about honey in both the comb and extracted form. It will do no harm to the sale of comb honey, or but little, at least. For there never was, and in all probability there never will be, a time when people will cease to disregard the looks of anything they wish to acquire, even to the matter of getting a life partner.

G. BOHRER.

Lyons, Kan.

QUESTION DRAWER

[By Mr. F. P. Adams, Brantford]

The following questions were sent us too late to be answered in the August C.B.J. As the writer has had experience only with outdoor wintering, we felt it would be presumptuous to answer the questions. We have therefore asked Mr. F. P. Adams to supply the answers. We know of no one better qualified than Mr. Adams. He is one of the exceptionally successful bee-keepers of Canada, both in the production of comb and extracted honey and the rearing of queens. He winters in the cellar, and we can recommend with confidence what he has to say thereon.

Question—(1) In wintering a number of colonies in a bee cellar, what is the proper way to pack hives?

(2) What should a hive weigh to have sufficient stores for winter in a good colony?

(3) In using foundation comb for extracting super, what is the proper grader to use?

(4) In using a shallow super for extracting, is it necessary to have a queen-excluder between?—R. R. Robb.

Answer—(1) To fix hives for wintering in a cellar I first want to know whether the cellar is damp or dry, and whether the temperature can be kept at about the proper degree. For a well-ventilated, dry cellar I leave on the honey-boards and covers over the hives, turn the bottom boards for the $\frac{7}{8}$ -inch entrance, and, after hives are placed in the cellar, raise the hive bodies about $\frac{1}{2}$ inch from the bottoms by means of blocks under each corner. If the cellar is damp and cool, I would still give the same amount of ventilation in the bottom. On top of the hives, instead of the tight covers, would put several thicknesses of burlap or old carpets, in order to conserve the heat, and still give a small amount of ventilation on top. The hives may be piled several tiers deep, being careful to

give the bottom boards a slight slope towards the entrances.

(2) Go through the hives now and see that at least six or seven frames are filled with honey or sugar syrup. It is not very satisfactory to go by the weight, since other things beside the stores affect the weight of the hives.

(3) If combs are wired, use light or medium brood, and if not wired, use the heavy brood foundation.

(4) Yes. F. P. ADAMS.

A FEW MORE DON'TS

Don't expect much from D. this month, as we are in Toronto exhibiting a small portion of our honey, and we are kept busy trying to hold our own with our competitors, who are receiving honey daily from Renfrew, Niagara Falls and other points. Those bee-keepers who supply the honey for the exhibitors are to be congratulated, as they will likely get a fancy price, especially the one from the Falls, as he supplied three exhibitors with comb honey, and it is all very fancy.

Don't fail to exhibit at Toronto next fall, for the way the prize list is fixed up now you need not be a producer, only a bonâ fide bee-keeper, with a few colonies or a lot, as the case may be, and then buy your honey all over and exhibit it as your product. See how large you would look in the eyes of the public, and you would likely feel big yourself when you looked at your banner hanging over some other bee-keepers' honey and selling it as your own product. See?

Don't fail to look after your bees this fall and see that they have lots of stores; better too much than one-half pound too little. So don't neglect your bees.

D. ANGUISH.

[My dear D., "don't" go after the other fellow too hard. Perhaps there are some extenuating circumstances. We think, however, in the interests of "true sport," that no one should be allowed to run a horse without being the owner thereof. Honey exhibited at our own country of national shows should be the production of the exhibitor.—E.d.]

BEE-KEEPING

[By O. C. Fulton]

The subject business has b in the bee pag books until it how many bee culture of bees fullest sense of could be count hand. But in must consider i stand it in th keeper. Litera mean that the b keep bees for a dition hardly e consider the sul light—as one's specialty.

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BEE-KEEPING AS A BUSINESS

[By O. C. Fuller, Chillisquaque Apiaries, Turbotville, Pa.]

The subject of bee culture as a sole business has been discussed pro and con in the bee papers and bee-keepers' text-books until it is about exhausted. Yet how many bee-keepers are making the culture of bees their sole business in the fullest sense of the term? I think they could be counted on the fingers of one hand. But in taking up this subject we must consider it in the sense we understand it in the language of the bee-keeper. Literally speaking, it would mean that the bee-keepers do nothing but keep bees for a livelihood. As that condition hardly exists, we shall have to consider the subject in a little different light—as one's principal occupation or speciality.

As bee-keeping is naturally a rural pursuit, it follows that the great majority of bee-keepers own or live on small pieces of land, which they cultivate to some extent as an adjunct to their regular business of keeping bees, and the income from this source must, of course, be reckoned as a part of the proceeds of the business. The bee-keeper may perhaps keep a horse, a cow, a few hens, and several hogs, the proceeds from which very materially adds to his income, and yet not destroy his just title of specialist. We cannot truthfully say that the farmer is any less a farmer, or that he does not pursue the business of farming, because he does some odd jobs for a neighbor with his team or some work in a different line in the winter months when there is a slack time on the farm. Therefore we shall have to consider bee-keeping as a business on these same lines. I, however, agree with Mr. Hutchinson, in his paper read at the St. Louis convention, that general farming or any other occupation that takes up the greater part of one's time will not work with bee-keeping, and therefore not admissible as an adjunct

to the successful cultivation of the honey bee. Yet we cannot ignore the fact that a large proportion of the bees in Pennsylvania are kept upon the farms. It is advisable that farmers keep a few bees to fertilize the blossoms of the field, orchard and garden. The bees thus kept generally supply the farmer's table with honey, and he often has some to sell besides, although the amount is not equal to that taken by the specialist, and is almost always inferior in appearance, due generally to neglect and failure to give the proper attention to the bees when storing. But with all this neglect, almost allowing the bees to shift for themselves, we frequently hear farmers say that their bees are the most profitable thing on the farm. If bees are profitable when kept on the farm as a side issue, then they must be very profitable when kept without another hampering occupation in the way.

I venture the assertion, without the risk of contradiction, that there is no other rural pursuit that will bring the returns in ready cash that bee-keeping will, taking into account the capital invested and labor involved.

Bee-keeping has always been considered by some as an uncertain and risky business, due to the fact that flowers fail to yield nectar in some seasons, and to the heavy winter losses which have frequently taken place. To the first I would say that we do sometimes have poor seasons when bees do not gather a surplus of honey for their keepers, but those seasons come only occasionally, and the profit secured from the bees in the good seasons ought and will carry the bee-keeper over the poor ones. In speaking of the winter losses, I would say that they are not so great now as they were in former years, due largely to the fact that bee-keepers are learning more about the wintering problem. By giving proper protection during winter (other conditions being equal), there need be no great fear on that score, if the bee-keeper thoroughly understands his business. I,

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therefore, believe that the investment of capital in the bee business is attended with no greater risk of loss than if invested in any other legitimate business venture.

If we have once decided to make bee-keeping our business, and have any hampering prefixes or suffixes coupled with it, we must begin at once to amputate at both ends if we expect to have a full measure of success. There are critical times in every apiary when the apiarist cannot possibly be bothered with any other work and must put in full time with his bees.

A successful bee-keeper can never afford to procrastinate, for procrastination is the thief of honey and money to the apiarist. If we put off for a single day the giving of more surplus room to the bees, when needed, it means the loss of many dollars in a large apiary.

We will now look about us and see what conditions are necessary to the successful prosecution of the business. First, and the most important factor, in my opinion, is location. Fortunately, our old State of Pennsylvania is very lavish in giving us a great variety of honey-producing flora, and I do not think there is a single locality in the State that would not support from ten to one hundred colonies of bees. In looking about for a good location for our apiaries we should take the lay of the ground and the abundance of honey-bearing flowers into careful consideration. The character of the soil should also be studied. If I were to choose the ground for an apiary, I should try to get a piece of ground that is dry, and which would never become wet or flooded. It should slope gently to the south or southeast, with a hill or on elevation on the north and west of the apiary to protect it from heavy wind storms and cold blasts, especially if the bees be wintered on their summer stands. A brook or small stream of water close to the apiary is also very desirable, as the bees will not thus have to go far from their hives for water. Many bees

are lost in the early spring by being compelled to go too great a distance for their supply of water. The cold chilling winds of this season are fatal to bees.

Having found a place like this, with plenty of honey-yielding flowers within easy reach, we have an ideal location.

We must now study the flowers and find out when they bloom, and when we may expect a yield of honey or pollen from them, so that we may be ready for the honey flow when it comes, and then we should manage our bees accordingly. As the honey flora is essentially uniform throughout the State, the management of the bees is practically the same. In this connection I might mention the most important honey and pollen-yielding plants of our State. By the time spring has fairly begun, the tag alders and the willows blossom and the bees revel in their pollen, the first of the season. (Brood-rearing now begins in full blast.) This is followed by the opening of the soft maples, with their bounteous supply of both honey and pollen. Dandelions, sugar maples, fruit trees and dogwood follow in close succession. A short intermission now takes place, then the raspberries come into bloom, followed closely by the clovers with their feast for the bees. Before the clovers cease to yield, buckwheat is beginning to give out its fragrance, and next the season closes with a sea of goldenrod and asters.

This is a list of the most important honey plants in my location, and I give it as a hint to the prospective specialist. It is what I consider a fairly good location for the bee-keeping business. This is by no means a full list of the honey and pollen-bearing trees and plants that are visited by bees. There are many others of minor importance. I have omitted the linden or basswood tree, because very little of it grows in my locality, but it is one of our most profuse honey-yielders in parts of our State where it has not yet been cut down and destroyed by lumbermen.

If the place like have no fe however, h should be r a large api area of a ce surplus hon this connect character of be regarded by close ob the characte much influer the state of ing the freq thorty that the flow of white clover. careous and c better than c conditions wh not yield at sandy loam w would, theref keeper to tak into considera tion for his a The next in of bees. Muc general purpos bees does not e fine our selecti have at presen the different down to the located where plant I would F ed Italian. But of the State v buckwheat are t tiful, I prefer with the black, ans do not worl crossing them v work on buckwh I do not wish it keep all hybrids buy and try to r But I keep all black drones, ar

If the prospective specialist has found a place like I have described, he need have no fear of the results, providing, however, he does his part well. But it should be remembered, however, that in a large apiary it requires a considerable area of a certain honey plant to produce surplus honey in paying quantities. In this connection we might examine the character of the soil. I do not wish to be regarded as out of the ordinary, but by close observation I have found that the character of the soil has nearly as much influence on the flow of honey as the state of the weather, notwithstanding the frequent assertion by good authority that climatic conditions control the flow of honey. Take, for example, white clover. I have found that on calcareous and clay loam soils it yields much better than on gravelly soils, and under conditions when on gravelly soils it does not yield at all. The same is true of sandy loam underlaid with limestone. It would, therefore, be well for the bee-keeper to take the character of the soil into consideration when selecting a location for his apiary.

The next important factor is the kind of bees. Much has been said about a general purpose bee, but as that race of bees does not exist, we shall have to confine our selection to the varieties that we have at present. I have tried several of the different strains, but have settled down to the conclusion that if I were located where clover is the main honey plant I would prefer the pure three-banded Italian. But as I am located in a part of the State where large quantities of buckwheat are grown, and clover is plentiful, I prefer a direct cross of Italians with the black, or German, for the Italians do not work well on buckwheat. By crossing them we have a bee that will work on buckwheat as well as on clover. I do not wish it to be understood that I keep all hybrids—far from it. I always buy and try to raise pure Italian queens. But I keep all queens that mate with black drones, and their colonies nearly

always pile up more supers of honey than the pure Italians do. Therefore the selection of the race of bees best adapted to the bee-keeper's location depends somewhat upon the kind of honey plants found in that section.

Much of the bee-keeper's success depends also on the kind of hive used. But I shall omit to mention a choice of hive in the fear of getting on somebody's corns. Suffice it to say that the bee-keeper should use a modern, up-to-date hive. After a crop of honey has been secured, it seems to me that time and money should not be wasted in shipping it away to the large cities to be sold, when it could all be disposed of near home by the apiarist himself by working up honey routes. Thus the transportation charges and commission could be saved. Another big item to help swell the bee-keeper's pocketbook. Establishing honey routes in a new territory is up-hill work for a time, but you will soon get all the customers that you are able to supply, as your product becomes better and more favorably known. Only a few years will pass until you will have no need to peddle honey, as your customers will send in their orders to your home or come and get their supply. This is my experience along that line.

I believe that every large bee-keeper should make his own foundation, and by so doing one-half the outlay of cash for foundation could be saved. It does seem to me a waste of money to sell our wax for 25c per pound, and turn around and pay more than double that for foundation. By the possession of foundation mills, with a warm room to work in, it could all be made at home during the winter. We would then have nice fresh foundation for the bees to work on, and no time lost by them trying to soften some old hard foundation in the height of a heavy honey flow, when time means money. In the disposal of his honey, the manufacture of wax into foundation, getting sections, hives and supers ready for the next season, lies the partial solution

of the problem, "What shall the bee-keeper do to occupy his time during the winter?"

As the success or failure of any kind of business depends largely upon the qualifications and general make-up of the individual that undertakes it, so is it in bee-keeping as a business. It does not require a man or woman with greater physical strength than the ordinary man or woman possesses, but it does require a person with strength of character. That is to say that he should have a large amount of push and energy in his make-up, and at the same time have a mild, patient disposition, but be quick to act in an emergency. The bee-keeper should also be of a mechanical turn, as many little things about the apiary (and there are many) could be made by one handy with tools, thus saving the expense of buying.

A person that has a nervous temperament, who is easily excited, and goes about the apiary dodging every bee that may happen to come near him, will never succeed as a bee-keeper—much less as a specialist. Therefore we cannot close our eyes to the fact that many failures are due to the inadaptability of the individual to the business.

With the proper qualifications and a thorough knowledge of the subject, I cannot see an excuse for failure.

In a paper like this it is not possible to give more than a few hints and suggestions along the line of bee-keeping as a specialty, but the most important of these I have tried to enumerate. It should be understood, however, that bee-keeping as a business does not offer the opportunity to become very wealthy. It does, however, offer the opportunity of an independent life and a good living, with a fairly yearly surplus for a rainy day. Fortunately, the perfection of a man's happiness bears but little relation to the size of his fortune, and the bee-keeper, with the hum of the bees over his head, finds happiness deeper and sweeter than ever comes to the merchant prince with his thousands.

APPLICATION OF ELECTRICITY TO AGRICULTURE

In the weekly report (No. 236) issued by the Department of Trade and Commerce, Ottawa, appears a very unique statement by Sir Oliver Lodge, Principal of the Birmingham University, which cannot fail to be of interest to bee-keepers, although not directly bearing upon apiculture. We take the liberty of quoting it because of its great indirect importance to bee-keepers, and particularly to those bee-keepers who are directly interested in agriculture. We are living in a great age, when no man knows what science may bring forth. Certain it is that agriculture is on the eve of great advancement. What this may mean in the improved and increased production of clovers no man can foresee. Sir Oliver's statement shows the result of experiments in the application of electricity to crop growing, which is as follows:

"The method is to stretch over the field to be treated a number of wires on poles, something like low telegraph wires, but high enough for loaded wagons and all the usual farming operations to go on underneath the wires without let or hindrance. The wires are quite thin, and are supported by a few posts in long parallel spans, about thirty feet part. They are supported on the posts by elaborate high-tension insulators, and they extend over all the acreage under experiment, a control plot of similar land under similar conditions being, of course, left without any wires. The system of conductors is then connected at one post with a generator supplying positive electricity at a potential of something like 100,000 volts, and with sufficient power to maintain a constant supply of electricity at this kind of potential. Leakage immediately begins, and the charge fizzes off from the wires with a sound which is sometimes audible, and with a glow which is visible in the dark. Any one walking about below the wires can sometimes feel the effect on the hair of the head, as of a cob-

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web on the face. They are then feeling the stimulating action of the electrification. The electrification is maintained for some hours each day, but is shut off at night; it is probably only necessary to supply it during the early morning hours in summer time, and in spring time or in cold, cloudy weather for the whole day, or during the time of the plant's greatest activity.

"But at what stages of the growth of a plant the stimulus is most effective has still to be made out. However, in the case of wheat, both the ear and the straw is valuable, and the electrification is accordingly applied for a time each day during the whole period of growth until stooling begins. The power required to generate the electricity is very small, for although the potential is high, the quantity is insignificant, and the energy is accordingly comparatively trivial. It is known that even when natural atmospheric electricity has accumulated intensely, and has become a thunderstorm, the quantity even then is quite small, though the potential or tension is so enormous that the flashes are of astonishing violence and power while they last.

"The electricity can be generated in more than one way. It can be generated by the revolving glass plates of a static influence machine, usually known as a Wimhurst machine; or it can be generated by transforming up to high tension, and rectifying to one direction, the current of the revolving magnetic generator called a dynamo. The first is in many respects the simplest, and was used in the early and small-scale experiments, but it can hardly be regarded as an engineering method adapted to continuous or rough use. The latter is the one which in the trials now to be described we have adopted. The power is generated by a two-horse oil engine driving a small dynamo in an outhouse of the farm. Thence the current is taken by ordinary overhead wires to the field, where they enter a suitable weather-tight hut, which contains the transforming and rectifying ap-

paratus. The only moving part here is the 'break,' and if the original dynamo had been an alternator, even this might be dispensed with. The transformer is a large induction coil, specially made to stand continuous use, and its current is then rectified by means of a vacuum valve in accordance with a patented device of my own. The negative electricity is conveyed direct to earth, while high-tension electricity, all of positive sign, is led by a specially-insulated conductor out of the shed to the nearest post of the overhead insulated wires, which are thereby maintained at continuous high-positive potential.

Results of Experiments in 1906—Bushels of Wheat Per Acre

	Electri- fied plot.	Un-electri- fied plot.	Increase.
Canadian (Red Fife)..	35½	25½	40%
English (White Queen)	40	31	30%

"The electrified wheat sold at prices some 7½% higher, several millers in baking tests finding that it produced a better baking flour. The increase appeared to be due to better stooling.

"Hours of plant running were from March 16 to July 10, 1906, 621½ hours on 90 days; average electrical pressure corresponded to a ¾-inch spark. 1907, March 23 to July 27, 1,014 hours on 115 days; average pressure corresponded to a ¼-inch spark.

"In the case of mangels there was an increase of 25%, and in that of strawberries 35%, while the influence was almost equally marked upon raspberries and tomatoes."

Great Carriage Display

Already the applications for space for the display of carriages, etc., at the Central Canada Fair have been so numerous as to oblige the directors to set apart a portion of the machinery hall for displays in this line in addition to the regular carriage building. The display will be the best ever made in Ottawa.

Sept. 1908
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RESULTS OF CO-OPERATIVE EXPERIMENTS WITH AUTUMN-SOWN CROPS

Three hundred and seven farmers throughout Ontario conducted experiments with autumn-sown crops during the past year. Reports have been received from twenty-six of the counties of the Province. Those counties which furnished the greatest number of good reports of successfully-conducted experiments were Bruce, Norfolk, Middlesex, Grey and Halton. The experimenters deserve much credit for the good work they have done for themselves and for the farmers generally. Average results of the carefully-conducted coöperative experiments with autumn-sown crops are here presented in a very concise form:

Winter Wheat.—Three varieties of winter wheat were distributed last autumn to those farmers who wished to test some of the leading varieties on their own farms. The following are the averages in yield of straw and of grain per acre: Imperial Amber, 1.4 tons and 25.9 bushels; Abundance, 1.2 tons and 23.3 bushels; and No. 5 Red, 1.2 tons and 22.2 bushels.

Not only did the Imperial Amber give the greatest yield per acre in the coöperative experiments throughout Ontario in 1908 and in 1907, but it also came first in popularity with the experimenters in each of these years. The Imperial Amber will again be distributed throughout Ontario this autumn as one of the three varieties for coöperative experiments. The Dawson's Golden Chaff, which we distributed for coöperative experiments throughout Ontario in each of twelve years previous to the autumn of 1906, and which is probably grown more extensively in Ontario at the present time than all other varieties of winter wheat combined, has not been included in the coöperative tests since 1906.

Winter Rye.—Of the two varieties of winter rye distributed in the autumn of

1907, the Mammoth White stood first in average yield of grain with 34 bushels, and the Common second with 28.6 bushels per acre. Last year the Mammoth White surpassed the Common rye by an average of 5 bushels per acre throughout Ontario.

Fertilizers With Winter Wheat.—In the coöperative experiments with different manures applied in the spring of the year, the average yields of grain per acre for the past five years are as follows: Mixed Fertilizer, 27.6 bushels; Nitrate of Soda, 25.8 bushels; Muriate of Potash, 25.7 bushels, and Superphosphate, 25.3 bushels. The unfertilized land gave an average of 22.4 bushels per acre. The Superphosphate was applied at the rate of 320 pounds and the Muriate of Potash and the Nitrate of Soda each 160 pounds per acre. The Mixed Fertilizer consisted of one-third the quantity of each of the other three fertilizers here mentioned. The usual cost of the fertilizers, as used in these experiments, is between four and five dollars per acre.

Fodder Crops.—In each of five years the seed of Hairy Vetches and of Winter Rye has been distributed throughout Ontario for coöperative experiments in testing these crops for fodder purposes. In the average of the five years' experiments the Hairy Vetches produced slightly the largest yield of green fodder per acre, but in 1908 the largest yield was produced by the Winter Rye.

Distribution of Material for Experiments in 1908.—As long as the supply lasts, material will be distributed free of charge in the order in which the applications are received from Ontario farmers wishing to experiment and to report the results of any one of the following tests: 1, Three varieties of Winter Wheat; 2, two varieties of Winter Rye; 3, five Fertilizers with Winter Wheat; 4, Autumn and Spring Applications of Nitrate of Soda and Common Salt with Winter Wheat; 5, Winter Emmer with Winter Wheat or Winter Barley; 6, Hairy

Vetches and Crops. The one rod wide for numbers press, and th

O.A.C., Guelph

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Vetches and Winter Rye as Fodder Crops. The size of each plot is to be one rod wide by two rods long. Material for numbers 3 and 4 will be sent by express, and that for the others by mail.

C. A. ZAVITZ.

O.A.C., Guelph, Ont., Aug. 12, 1908.

A BEGINNER MAKES INQUIRY

Having just made a start at bee-keeping, I wish to ask a few questions. I bought a colony of mixed bees, supposed to be Italian and Black. Some of them are all black and some have one and two yellow or golden bands around the body. Each band is about as wide as this heavy line: . Would you class them as the Black or Italian bee?

They were hived July 1. Seemed to be working all right till about 1st of August; then I counted as many as twenty young bees on the platform, some dead and others barely moving. This had gone on for a week. I then closed the entrance halfway, and I have not seen any more since.

About the same time I saw a long white worm on the platform, which looked to me to be a moth worm, and for a few days the bees were bringing out bits of thin white sheets (not wax cells), and I saw two dead bees on the platform tangled up with something like the web of a moth cage. Would you say there were wax moths in the hive?

I saw an account of the expense of bee escapes. I took a few strips 2½" wide, nailed them together the size of the box, then nailed two strips 1" square across the centre ¾" apart. I then took two strips of tin and bent them thus:



putting the wide edge downward between the strips, so that the two edges of the tin were a trifle wider apart than the opening in a queen-excluder. I covered

the rest over with canvas cloth. I then lifted the top storey off, put on my bee escape, then replaced the top storey, and in the morning only one bee remained in the top storey. I then took box and all in the house; no trouble with bees at all—used no veil or smoker.

When I first got the colony it was covered with a cloth, and every time I would lift the cover I found a lot of very small ants on the cloth. I took it off and put on a piece of oilcloth, and have had no trouble with the pests since.

J. A. RUDOLPH.

Bornholm, Perth Co., Ont.

[It is our opinion that the queen of this hive is not a pure bred queen—hence the different colored bees. You can soon bring them to pure Italians by giving them a pure-bred Italian queen.

There is evidently some wax Moths in one or two of the frames. You should open the hive and examine the combs. If you see any of the moth web, tear it all out with the point of a nail, following the track of the web. The bees will build the cells up again.

Your bee escape was a very cheap and ingenious device. Most bee-keepers use the Porter Bee Escape. Many of us have not the time to make everything.

Heavy duck is the best we know of for cloth covers. The ants you speak of would have given you no trouble. They were evidently the small ants that one will see in abundance on the ground. They evidently crawled up the side of the hive and got under the cover. We would not recommend oil cloth as a cloth cover.

Be sure you examine your combs and have all moths removed before putting into winter quarters.—Ed.]

KEEP POSTED

The Canadian Bee Journal provides the most useful and up-to-date information concerning the bee industry. Subscribe now. One dollar per year.

McEVROY'S MANAGEMENT THE PAST SEASON

All Colonies Were Built Up Very Strong and Managed so as to Have no Swarming

[By Wm. McEvoy]

The spring being very unfavorable, I helped the bees at every check they met with during the last half of fruit bloom, and from that time until clover began to yield. By uncapping from time to time every inch of capped stores in all brood chambers had been uncapped before clover came into bloom. I also fed about 250 combs of capped stores, which I saved over for spring feeding.

This work of keeping all colonies well supplied with plenty of **unsealed** stores all through the time that the bees were gathering but very little honey gave big results in brood-rearing. When the right time came to put on supers I lifted up a comb of brood into the supers and kept the queen-excluders off, so as to give the queens a chance to go up, and as soon as the supers were pretty well filled with brood I shook the queens below and put on the queen-excluders. As soon as all the brood in these supers was capped I dealt part of it out here and there to other colonies not so strong, and soon had all colonies in grand condition for a crop. I then started putting on the second supers, lifting up two combs of brood above the queen-excluders and putting two empty combs in the centre of the brood chambers. Every time the supers were extracted two combs of brood were lifted above the queen-excluders and two empty combs were put in the brood chambers. This work of lifting up brood and putting empty combs in the brood chambers was done for two reasons: First, to give the queens more room to lay and get a greater increase in bees, and by so doing get more honey, and also to check nearly all swarming; second, to get a fine lot of well-fed and capped brood to make artificial swarms.

Later on many colonies became exceedingly strong in bees, and then we found lots of capped queen-cells in several supers. I split the jelly end of the cells a little to see the amount of food these had, and where I found abundance of jelly I closed the little knife cut and saved these. When the supers were brought in and the honey was extracted we took the combs of brood found in the supers and put these into hives by themselves. Sometimes I had several hives full of hatching brood on hand waiting to be used in making artificial swarms. I lifted some of my strongest colonies off their stands and then put hives full of hatching brood on these stands. I then took a comb of brood and the queen out of the old colony and put it in the hive of hatching brood, and then put the supers full of bees on this hiveful of hatching brood. I then took the old colony, which I had set to one side, and carried to a new stand. The field bees soon returned to the old stand, and then the storing went on just the same as before. This is one of the ways in which I made artificial swarms. In several supers I found queen-cells torn open and the queens killed by the first queen that hatched. In all such cases as this I carried the old colony to a new stand and placed the supers with the young queen in on the old stand. I then took the combs out, shook back the bees and filled the hive with combs of hatching brood, and then put on the supers. The most of the field bees that I carried away with the old colony and its queen would return to the old stand, and to make up for this I placed a hive full of hatching brood on the old colony. By this system I increased the bees on every stand, secured more honey, checked all swarming, and made many fine colonies from surplus brood.

Honey Labels.—Place your order for Honey Labels, Letter Heads, Bill Heads, Envelopes, etc., with The Hurley Printing Co. Satisfaction guaranteed

MR. E. F.

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MR. E. F. ROBINSON'S LETTERS CHALLENGED

In Mr. Robinson's most valuable letters in June and July numbers I find statements which might well stand correction. In the first place, on page 213, June number, he states that "the largest amount stored by a colony in one day has reached eleven pounds two ounces." In the year 1900 I extracted the honey in July during basswood bloom from two colonies of bees which had not swarmed. One colony was fairly well-bred Carniolans and the other Italians. The day after extracting they worked so hard that I decided to weigh them the following day to ascertain how much per day they were carrying. On the morning of the second day I got a neighbor to help me lift them on to the scales. Their respective weights were recorded. The same party came back in the evening and helped to weigh them again, and his testimony is herewith enclosed. We weighed the Carniolans first and found they had carried twenty pounds. It staggered us a little and made the writer wonder if the Italians were going to beat that, but expected they were, judging by the way they streamed into that hive all day long. When their test was made we found they had gained twenty-five pounds! I sent Gleanings a note of it, wishing to know at the same time what was the greatest amount they knew of being stored by a single colony in one day. They took no notice of it, and I supposed that they doubted my statement. I am satisfied that the Italian colony in question carried a similar amount for three days in succession. I had invited a Mr. Yost (a German who lived not far distant) to come and see them work. He came on the morning of the fourth day, and when he saw them he said, "Vell, Vell! I never saw anything like dot." I assured him that they were slacking up perceptibly from the three previous days, and at the same time they were dropping with their loads

as much as eighteen inches from the hive.

Another error I find in Mr. Robinson's writings is on page 252, July number, where he states that "It was not until 1850 that the Rev. Mr. Langstroth, of Butler County, Ohio, U.S.A., invented the movable-frame hive, which has so revolutionized apiculture. Previous to date the bees built their combs just as their natural instinct prompted them—about one inch apart from centre to centre." I have transferred a good many bees in years gone by from box to movable-frame hives, but never remember finding the combs so closely spaced as that, and, moreover, there would only be one-eighth of an inch bee space between the worker brood combs, which would not allow the bees a passage-way, and between drone comb there would be no space at all.

DAVID CHALMERS.

Poole, Ont.

To Whom It May Concern :

This is to certify that in the year 1900, during basswood bloom, I assisted Mr. David Chalmers, Bee Villa, to test the storing capabilities of two colonies of bees, one a hybrid Carniolan, the other an Italian, and in the evening found the former had carried twenty pounds of nectar and the latter twenty-five pounds

(Signed) JOHN FORREST.

"A Bee's Load."—E. F. Robinson, in the Canadian Bee Journal, says that a bee's load of honey, or nectar, is about one grain, from which he makes a number of startling deductions. Our experiments, published in November, 1907, page 70, go to show that Mr. Robinson has largely over-estimated. When working on clover the bee's load rarely exceeds three-tenths of a grain of nectar, yielding from three-twentieths to nine-fortieths of a grain of ripened honey. We showed that the ripened honey averaged three-quarters of a grain per drop, but the bee must load up again and again to produce that drop.—Irish Bee Journal.

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OUR FRENCH EXCHANGES

[By C. A. Procnier]

More Than One Queen in a Hive

We continue in this number the publication of a very remarkable article of the Rev. Father Guyot on this interesting question. We know that researches are being made in many places to make the introducing of more than one queen in each hive practicable and easy. In our June number we shall give the first results.—Editor.

"The colonies which have many laying queens," says A. K. Ferris, a bee-keeper, "do not seem to be able to work hard enough to please themselves. They rush on the nectar as long as the harvest lasts with an unknown zeal. One does not see this in those colonies with only one queen, and there follows as an inexplicable result these colonies with more than one laying queen never attempt to swarm."

"The act," says Alexander, "of keeping two or more laying queens in a colony at one time has, according to our experience up to the present, completely prevented swarming, for never did one of these colonies attempt to swarm while they had two or more laying queens, these queens having each access to all parts of the hive."

This is a point that we have understood with difficulty, for we should think that these strong colonies would be the first to swarm. To prove to ourselves whether we could provoke a very strong colony to swarm last summer or not, we introduced four good laying queens at one time. We examined them at the end of five days, and found the four queens living and in good harmony, having all the cells of the combs filled with eggs. This colony served us during the remainder of the summer for the raising of queens. Now and then we would take three or four queens for introducing in other colonies. Sometimes we would put five or six in a hive at a time, and there never were any quarrels or "balling."

I ask permission to deduce a theory of swarming from these facts, which at the present are unknown. I give it for what it is worth, but it seems reasonable enough to me. The motive which makes the swarm issue has been much discussed. Is it the queen which gives the signal of departure? Do the bees animate the queen? Each opinion has its partisans. Where is the truth? Here is the proposition which I believe possible to lay down:

The swarm is a massive flight of bees, caused by the terror of the queen in the face of an imminent death—terror which she succeeds in making the bees share.

These are the bees which prepare the swarm when, for whatever cause, they find themselves constrained, ill at ease. Their instinct shows them that they ought to leave a queen in the hive after the departure of a swarm. When there are many queens their instinct is defeated, and it does not search farther, however they may be constrained; they wait quietly that one of their sovereigns may give the signal of departure, but each of the latter do not dream of this; they are in a calm, peace, tranquillity; they remain in the hive. But this is not so in a colony where there is one queen. There the bees construct a number of royal cells and carry the eggs to them, for I believe that the queen never lays them there—lay eggs of enemies! Some she sees its cradle enlarged. She strives to destroy it, for her instinct makes her know that the virgin queens will massacre her without pity. Everywhere the bees are stopped, confusion is in the hive, the laying of eggs is suspended or greatly diminished, and the bees, highly excited by the terror of the queen, do not work much. But soon the cells are sealed, and then her terror reaches its climax—there is not any further means of escaping death. Fly! Fly! Even if she should be pained to withdraw herself—even if she should fall at the door of the hive without being able to take flight—it is necessary to fly.

And now, having concluded of the what are the principles by which the queens in one hive

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2. When two unite they keep explains the great

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"I had," says a nucleus placed of hybrids. A little should have to the disappeared. S

two Italian queens and one of them and well marked, and lost, and I could not

6. When in the experienced bee-keeper happened to me on inspecting a hive that never came back.

"I secured and the first import was then an inexperienced management of I lost sight of my great surprise queen with yellowing hive on the corner."

(To be continued)

Do not neglect before placing

And now, having drawn the practical conclusion of this study, we see at first what are the principal means and natural grace by which it is possible to find many queens in one hive.

1. As we have seen above, there is the mother and daughter. Observations are numerous. We append the following: Dr. Bruennigh speaks of one of his queens which continued to lay side by side with her daughter for eleven months and then suddenly disappeared.

2. When two or more first swarms unite they keep all their queens. This explains the great worth of these swarms.

3. When a swarm introduces itself into a habitated hive the two queens live.

4. In the case of the swarms of calamity.

5. When a queen, at the return of her fecundation flight, by mistake enters the wrong hive, she is often accepted.

"I had," says Mr. L. W. Beckwith, a nucleus placed near a strong colony of hybrids. A little after the time that she should have taken her nuptial flight she disappeared. Some time after I found two Italian queens in this strong colony, and one of them was particularly large and well marked, as the virgin that I had lost, and I concluded that this was the same."

6. When in the hands of an inexperienced bee-keeper a queen escapes, as happened to me one time. When I was inspecting a hive the queen flew off and never came back. Mr. Beckwith tells me "I secured an Italian queen, probably the first imported into our country. I was then an inexperienced beginner in the management of queens. She flew up and I lost sight of her. Five days after, to my great surprise and joy, I found a queen with yellow hands in a neighboring hive on the combs with the black hands."

(To be Continued)

Do not neglect to feed your bees before placing them in winter quar-

BREAKING COMBS BEFORE MELTING—QUEENS MATING

In my letter on page 172 of May C. B. J., I recommend the plan of crushing and crumbling the cells or cocoons with a mallet when cold and dry, so that there are no cells left to hold the wax when passing through the pressing process. Mr. Chalmers made some comments thereon (page 223). I think Mr. Chalmers did not quite understand the main point of my letter. He recommends to chop the combs to small pieces with a sharp spade. If he would read my letter again he would see a great difference between the two points. My point was to crumble the cells, or cocoons, as well as breaking in small pieces, which latter is necessary in any case. I consider it a great advantage to break down all cells; there are then no "cups" to retain the wax when pressing. He simply recommends to chop up in small pieces for the boiler. I trust Mr. Chalmers will take no offence at my calling his attention to this.

Will you kindly state how a virgin queen can be fertilized by her own son. I saw the above statement on page 315 of August C.B.J.

JOHN BAILEY.

Bracebridge, Ont.

[A virgin queen cannot be fertilized by her own son, for the very good reason she has no "son." This must be a slip of the pen on the part of Mr. Robinson. He doubtless intended to say "brother." Or possibly it is a printer's error. It is well, however, that you have called attention to it.—Ed.]

Architects' Day

The Architects' Institute of Canada, is to hold its second annual convention in Ottawa during fair week, and as the members purpose visiting the Central Canada Fair on Wednesday, Sept. 23rd, the directors have decided to name that day of the fair "Architect's Day."

APICULTURE IN RELATION TO AGRICULTURE

[By Isaac Hopkins, Apiarist, New Zealand]

The benefits derived by both agriculturists and horticulturists from the labors of the bee are now very generally understood and acknowledged; but still cases sometimes occur, though rarely, of farmers objecting to the vicinity of an apiary, and complaining of bees as "trespassers," instead of welcoming them as benefactors.

Are Bees Trespassers?

It is not, perhaps, surprising that at first a man should imagine he was being injured in consequence of bees gathering honey on his land, to be stored up elsewhere, and for the use of other parties; he might argue that the honey belonged by right to him, and even jump at the conclusion that there was so much of the substance of the soil taken away every year, and that his land must therefore become impoverished. It is true that if he possessed such an amount of knowledge as might be expected to belong to an intelligent agriculturist, working upon rational principles, he should be able, upon reflection, to see that such ideas were entirely groundless. Nevertheless, the complaint is sometimes made, in a more or less vague manner, by persons who ought to know better; and even bee-keepers appear occasionally to adopt an apologetic tone, arguing that "bees do more good than harm," instead of taking the much higher and only true stand by asserting that bees, while conferring great benefits on agriculture, do no harm whatever, and that the presence of an apiary on or close to his land can be nothing but an advantage to the agriculturist.

Beneficial Influence of Bees on Agriculture

The value of the intervention of bees in the cross-fertilization of plants is dwelt upon in Chapter III., "Australasian Bee Manual," third edition, and the reader is

referred for further information to the works of Sir J. Lubbock and of Darwin. The latter, in his work on "Cross and Self Fertilization of Plants," gives the strongest evidence as to the beneficial influence of bees upon clover crops. At page 169, when speaking of the natural order of leguminous plants, to which the clovers belong, he says, "The cross seedlings have an enormous advantage over the self-fertilized ones when grown together in close competition"; and in Chapter X., page 361, he gives the following details of some experiments, which show the importance of the part played by bees in the process of cross-fertilization:

Trifolium repens (White Clover).—Several plants were protected from insects and the seeds from ten flower heads of these plants and from ten heads on other plants growing outside the net (which were visited by bees) were counted, and the seeds from the latter plants were nearly ten times as numerous as those from the protected plants. The experiment was repeated in the following year and twenty protected heads now yielded only a single abortive seed, whilst twenty heads on the plants outside the net (which I saw visited by bees) yielded 2,290 seeds, as calculated by weighing the seeds and counting the number in weight of two grains.

Trifolium pratense (Purple Clover).—One hundred flower heads on plants protected by a net did not produce a single seed, whilst one hundred on plants growing outside (which were visited by bees) yielded 68 grains' weight of seed; and as eighty seeds weighed two grains, the hundred heads must have yielded 2,720 seeds.

Here we have satisfactory proof of the effect of cross-fertilization brought about by bees upon the clovers and other plants growing in meadows and pastures. It is the certain production of a large number of vigorous seeds, as compared with the chance only of a few and worthless seeds if self-fertilization were to be depended upon. In the case of meadow plants it enables the farmer to reserve seed for his own use or for sale, instead of having to purchase it, while at

the same time the hay is, as we have seen, improved during the process of seed. In the case of those vigorous plants which come to maturity and will send up plants to take the place of those which have died out, or to fill up spaces, thus tend to the renewal and strengthening of the agriculturist's stock. The best judge of the beneficial effect of bees on fruit trees has been Mr. Cheshire in the "Bee Journal," and in his articles upon "The Bee in Agriculture," in the "Bee Journal," and also "Bulletin of the New Zealand Beekeepers' Association." In fact, the main object of bees can be rendered; what is the question that bees do

Do Bees Harm the

then, the question is, does the agriculturist not benefit from the visits of the bees to me in the field? Any clover, how valuable, is not obliged to me for such services?" It is a question one might expect the researches of the agriculturist will furnish to establish the truth. That saccharine matter is excreted and retained in the plant, is not one of the main objects of the bee's life which exhaust the soil, but plants which are furnished with an abundance of water, and not content with the natural or organic substance of the soil or by the man's hand; and, secondly, which it is apparent from the nectari-

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seed. In the case of pasture lands, such
of those vigorous seeds as are allowed to
come to maturity and to fall in the field
will send up plants of stronger growth to
take the place of others that may have
died out, or to fill up hitherto unoccupied
spaces, thus tending to cause a constant
renewal and strengthening of the pasture.
The agriculturist himself should be the
best judge of the value of such effects.

The beneficial effect of the bees' visits
to fruit trees has been well illustrated by
Mr. Cheshire in the pages of the British
Bee Journal, and by Professor Cook in
his articles upon "Honey Bees and Hor-
ticulture," in the American Apiculturist.
See also "Bulletin No. 18, Bee Cul-
ture," New Zealand Department of Agri-
culture.) In fact, even those who com-
miserably deny the services
they render; what they contest is the as-
sertion that bees do no harm.

Do Bees Harm the Soil or the Crops?

then, the question to be considered.
The agriculturist may say, "Granting
that the visits of the bees may be service-
able to me in the fertilization of my fruit
trees, how will you prove that I
am not obliged to pay too high a price
for such services?" For the answer to
this question one must fall back upon
the researches of the agricultural chemist,
which will furnish satisfactory evidence
to establish the two following facts:

First, that saccharine matter, even when
assimilated and retained within the body
of the plant, is not one of the secretions of
plant life which can in any way tend
to exhaust the soil, being made up of con-
stituents which are furnished everywhere
in superabundance by the atmosphere and
water, and not containing any of the
mineral or organic substances supplied by
manure or by the manures used in agri-
culture; and, secondly, that in the form
in which it is appropriated by bees,
from the nectaries of flowers or as

honeydew from the leaves, it no longer
constitutes a part of the plant, but is, in
fact, an excrement, thrown off as super-
fluous, which if not collected by the bee
and by its means made available for the
use of man would either be devoured by
other insects which do not store honey,
or be resolved into its original elements
and dissipated in the air.

The foregoing statements can be sup-
ported by reference to authorities which
can leave no doubt as to their correctness
—namely, Sir Humphrey Davy in his
"Elements of Agricultural Chemistry,"
written more than seventy years ago, and
Professor Liebig in his "Chemistry in its
Application to Agriculture and Physiol-
ogy," written some ten years later, and
the English version of which is edited by
Dr. Lyon Playfair and Professor Gregory.
These works, which may be said to form
the foundation of a rational system of agri-
culture, were written with that object
alone in view, and the passages about to
be quoted were not intended to support
any theory in favor of bee culture or
otherwise; they deal simply with scien-
tific truths which the layman can safely
follow and accept as true upon such unde-
niable authority, although he may be in-
capable himself of following up the pro-
cesses which have led to their discovery
or which prove their correctness.

Saccharine Matter of Plants Not Derived From the Soil

Liebig, when describing the chemical
processes connected with the nutrition of
plants, informs us (at page 4, fourth edi-
tion) that:

There are two great classes into which
all vegetable products may be arranged.
The first of these contain nitrogen; in
the last this element is absent. The com-
pounds destitute of nitrogen may be di-
vided into those in which oxygen forms a
constituent (starch, lignine, etc.) and
those into which it does not enter (oils
of turpentine, lemon, etc.).

And, at page 141, that:

Sugar and starch do not contain nitro-
gen; they exist in the plants in a free
state, and are never combined with salts

or with alkaline bases. They are compounds formed from the carbon of the carbonic acid and the elements of water (oxygen and hydrogen).

Sir Humphrey Davy had already stated that, "according to the latest experiments of Gay Lussac and Thenard, sugar consists of 42.47 per cent. of carbon and 57.23 per cent. of water and its constituents." Now, Liebig in several parts of his work shows that the carbon in sugar and all vegetable products is obtained from carbonic acid in the atmosphere; and that "plants do not exhaust the carbon of the soil in the normal condition of their growth; on the contrary, they add to its quantity."

Derived From the Atmosphere and Rain Water

The same authority shows that the oxygen and hydrogen in these products are derived from the atmosphere and from rain water; and that it is only the products containing nitrogen (such as gluten or albumen in the seeds or grains), and those containing mineral matter (silex, lime, aluminum, etc.), which take away from the soil those substances that are required to be returned to it in the shape of manures. The saccharine matter, once it is secreted by the plant and separated from it, is even useless as a manure. Liebig says on this head, page 21:

The most important function in the life of plants, or, in other words, in their assimilation of carbon, is the separation--we might almost say the generation--of oxygen. No matter can be considered as nutritious or as necessary to the growth of plants which possesses a composition either similar to or identical with theirs, because the assimilation of such a substance could be effected without the exercise of this function. The reverse is the case in the nutrition of animals. Hence such substances as sugar, starch and gum, themselves the products of plants, cannot be adapted for assimilation; and this is rendered certain by the experiments of vegetable physiologists, who have shown that aqueous solutions of these bodies are imbibed by the roots of plants and carried to all parts of their structure, but are not assimilated; they

cannot, therefore, be employed in their nutrition.

Nectar of Plants Intended to Attract Insects

The secretion of saccharine matter in the nectaries of flowers is shown to be one of the normal functions of the plant, taking place at the season when it is desirable to attract the visits of insects for the purposes of its fertilization. It may, then, be fairly asserted that the insect, when it carries off the honey from any blossom it has visited, is merely taking with it the fee or reward provided by Nature for that special service.

Sometimes Thrown Off as Superfluous

There are, however, cases when considerable quantities of such matter are thrown off or exuded by the leaves, which effect is taken to indicate an abnormal or unhealthy condition of the plant. At pages 106 and 107 of Liebig's book (speaking of an experiment made to induce the rising sap of a maple tree to dissolve raw sugar applied through a hole cut in the bark) he shows that:

When a sufficient quantity of nitrogen is not present to aid in the assimilation of the substances destitute of it, these substances will be separated as excrement from the bark, roots, leaves and branches.

In a note to this last paragraph we are told that:

Langlois has lately observed, during the dry summer of 1842, that the leaves of the linden tree became covered with a thick and sweet liquid in such quantities that for several hours of the day it ran off the leaves like drops of rain. Many kilograms might have been collected from a moderate-sized linden tree.

And further on, at page 141, he says:

In a hot summer, when the deficiency of moisture prevents the absorption of alkalies, we observe the leaves of the linden tree, and of other trees, covered with a thick liquid containing a large quantity of sugar; the carbon of the sugar may, without doubt, be obtained from the carbonic acid of the air. The generation of the sugar takes place in the leaves,

all the constituting the alkalies participate in Sugar does not moist seasons, jecture that t as sugar in tl been applied constituents of having had circulation.

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all the constituents of the leaves, including the alkalies and alkaline earths, must participate in effecting its formation. Sugar does not exude from the leaves in moist seasons, and this leads us to conjecture that the carbon which appeared as sugar in the former case would have been applied in the formation of other constituents of the tree in the event of its having had a free and unimpeded circulation.

These quotations will probably be considered sufficient to justify the assertion that the gathering of the honey from plants can in no possible way tend to exhaust the soil or affect its fertility. There is no difference of opinion among scientific men as to the sources from which the saccharine matter of plants is derived. Since Liebig first put forward his views on that subject, as well as with regard to the sources from which the plants derive their nitrogen, the principles of agricultural chemistry have been studied by the most eminent chemists, some of whom combated the views of Liebig on this latter point (the source of nitrogen and its compounds), and Liebig himself seems to have modified his views on that point; but there has been no difference of opinion about the saccharine matter, as to which Liebig's doctrine will be found given unaltered in the latest colonial work on the subject, MacIvor's "Chemistry of Agriculture," published at Melbourne a few years ago.

Superfluous Nectar Evaporated if Not Taken by Insects

That the nutritive quality of the plants in any growing crop is not diminished by the abstraction of honey from their blossoms would appear to be evident from the fact that those plants have actually thrown off the honey from the superfluity of their saccharine juices, as a matter which they could no longer assimilate. There would appear, on the other hand, to be good reason to believe that the plants themselves become daily more nutritive during the period of their giving off honey—that is, from the time of flowering to that of ripening their seeds. This

is a point upon which, I believe, all agricultural chemists are not quite agreed, but the testimony of Sir H. Davy is very strong in favor of it. In the appendix to his book, "Elements of Agricultural Chemistry," he gives the results of experiments made conjointly by himself and Mr. Sinclair, the gardener to the Duke of Bedford, upon nearly a hundred different varieties of grasses and clovers. These were grown carefully in small plots of ground as nearly as possible equal in size and quality; equal weights of the dried produce of each, cut at different periods, especially at the time of flowering and at that of ripened seeds, were "acted upon by hot water till all their soluble parts were dissolved; the solution was then evaporated to dryness by a gentle heat in a proper stove, and the matter obtained carefully weighed, and the dry extract, supposed to contain the nutritive matter of the plants, was sent for chemical analysis." Sir H. Davy adds his opinion that this "mode of determining the nutritive power of grasses is sufficiently accurate for all the purposes of agricultural investigation." Further on he reports: "In comparing the compositions of the soluble products afforded by different crops from the same grass, I found, in all the trials I made, the largest quantity of truly nutritive matter in the crop cut when the seed was ripe, and the least bitter extract and saline matter and the most saccharine matter, in proportion to the other ingredients, in the crop cut at the time of flowering." In the instance which he then gives as an example the crop cut when the seed had ripened showed 9% less of sugar, but 18% more of mucilage and what he terms "truly nutritive matter," than the crop cut at the time of flowering. From this it would follow that during the time a plant is in blossom and throwing off a superfluity of saccharine matter in the shape of honey, the assimilation of true nutritive matter in the plant itself is progressing most favorably. In any case, it is clear that the honey, being once exuded, may be taken

away by bees or any other insects (as it is evidently intended to be taken) without any injury to the plant, by which it certainly cannot be again taken up, but must be evaporated if left exposed to the sun's heat.

Question as to Grazing Stock

There is, however, a plea put in by the agriculturist on behalf of his grazing stock, and one which he generally seems to consider unanswerable. He says, "Even if it be admitted that the removal of the honey from my farm is neither exhausting to the soil nor injurious to the plants of the standing crop, still it is so much fattening matter which might be consumed by my stock if it had not been pilfered by the bees."

Now, it may at once be admitted that honey consists to a great extent of fattening matter, though it may be allowable to doubt whether in that particular form it is exactly suitable as food for grazing cattle. Although it is quite true that the saccharine matter assimilated in the body of a plant tends to the formation of fat in the animal which eats and digests that plant, still one may question the propriety of feeding the same animal on pure honey or sugar. We may, however, waive that view of the subject, as we shall shortly see that it is only a question of such homoeopathically small doses as would not be likely to interfere with the digestion of the most delicate grazing animal, any more than they would considerably increase its weight. Admitting, therefore, that every pound of honey of which the grazing stock are deprived by bees is a loss to the farmer, and therefore to be looked upon as a set-off to that extent against the benefits conferred by the bees in other ways, it will be necessary to consider to what extent it is possible that such loss may be occasioned.

Quantity of Honey Furnished by Pasture Land

In the first place, it must be recollected that a large proportion—in some cases the great bulk—of the honey gathered by

bees is obtained from trees, as, for instance, the linden in Europe, the basswood and maple in America, and in this country the forest trees, nearly all of which supply rich forage for the bee, and everywhere from fruit trees in orchards. A large quantity is gathered from flowers and flowering shrubs reared in gardens; from clover and other plants grown for hay, and not for pasture; and even in the field there are many shrubs and flowering plants which yield honey, but which are never eaten by cattle. Pastures, therefore, form but a small part of the sources from which honey is obtained; and in dealing with this grazing question we have to confine our inquiries to clovers and other flowering plants grown in open pastures, and such as constitute the ordinary food of grazing stock. In order to meet the question in the most direct manner, however, let us assume the extreme case of a large apiary being placed in a district where there is nothing else but such open pastures, and growing only such flowering plants as are generally eaten by stock. Now, the ordinary working range of the bee may be taken at a mile and a half from the apiary on all sides, which gives an area of about 4,500 acres for the supply of the apiary; and if the latter consists of a hundred hives, producing an average of 100 pounds of honey, there would be a little more than two pounds of honey collected off each acre in the year; or, if we suppose so many as two hundred hives to be kept at one place, and to produce so much as ten tons of honey in the season, the quantity collected from each acre would be four pounds to five pounds.

Proportion Possibly Consumed by Stock

Let us next consider what proportion of those few pounds of honey could have found its way into the stomachs of the grazing stock if it had not been for the bees. It is known that during the whole time the clover or other plants remain in blossom, if the weather be favorable, there is a daily secretion of fresh honey, which, if not taken at the proper time by

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bees or other insects, is evaporated during the midday heat of the sun. It has been calculated that a head of clover consists of fifty or sixty separate flowers, each of which contains a quantity not exceeding one five-hundredth part of a grain in weight, so that the whole head may be taken to contain one-tenth of a grain of honey at any one time. If this head of clover is allowed to stand until the seeds are ripened it may be visited on ten or even twenty different days by bees, and they may gather, on the whole, one, or even two, grains of honey from the same head, whereas it is plain that the grazing animal can only eat the head once, and consequently can only eat one-tenth of a grain of honey with it. Whether he gets that one-tenth grain or not depends simply on the fact whether or not the bees have exhausted that particular head on the same day just before it was eaten. Now, cattle and sheep graze during the night and early morning, long before the bees make their appearance some time after sunrise; all the flowering plants they happen to eat during that time will contain the honey secreted in the evening and night-time; during some hours of the afternoon the flowers will contain no honey, whether they have been visited by bees or not; and even during the forenoon, when the bees are not busy, it is by no means certain that they will forestall the stock in visiting any particular flower. If a field were so overstocked that every head of clover should be devoured as soon as it blossomed, then, of course, there would be nothing left for the bees; but if, on the other hand, as is generally the case, there are always blossoms left standing in the pasture, some of them even till they wither and shed their seeds, then it must often happen that after bees shall have visited such blossoms ten or even twenty times, and thus collected one or even two grains of honey from one head, the grazing animal may, after all, eat that particular plant and enjoy his one-tenth of a grain of honey just as well as if there had never been any bees in the

field. If all these chances be taken into account, it will be evident that out of the four pounds or five pounds of honey assumed to be collected by bees from one acre of pasturage, probably not one-tenth, and possibly not even one-twentieth, part could under any circumstances have been consumed by the grazing animals—so that it becomes a question of a few ounces of fattening matter, more or less, for all the stock fed upon an acre during the whole season—a matter so ridiculously trivial in itself, and so out of all proportion to the services rendered to the pasture by the bees, that it may be safely left out of consideration altogether.

Bee-keeping as a Branch of Farming

There is still one point which may possibly be raised by the agriculturist or land-owner: "If the working of bees is so beneficial to my crops, and if such a large quantity of valuable matter may be taken, in addition to the ordinary crops, without impoverishing my land, why should I not take it instead of another person who has by right no interest in my crop or my land?" The answer to this is obvious. It is, of course, quite open to the agriculturist to keep any number of bees he may think fit; only, he must consider well in how far it will pay him to add the care of an apiary to his other duties. No doubt every one farming land may with advantage keep a few stands of hives to supply his own wants in honey—the care of them will not take up too much of his time, or interfere much with his other labors; but if he starts a large apiary with the expectation that it shall pay for itself, he must either give up the greater portion of his own time to it or employ skilled labor for that special purpose; and he must recollect that the profits of bee-keeping are not generally so large as to afford more than a fair remuneration for the capital, skill and time required to be devoted to the pursuit. In any case, he cannot confine the bees to work exclusively on his own property, unless the latter is very exten-

sive. When such is the case, he may find it greatly to his advantage to establish one or more apiaries to be worked under proper management, as a separate branch of his undertaking; but in every case, whether he may incur or share the risks of profit and loss in working an apiary or not, the thing itself can only be a source of unmixed advantage to his agricultural operations, and consequently if he does not occupy the ground in that way himself, he should be glad to see it done by any other person.

WHERE THE PURE FOOD LAW IS NOT NEEDED

The shameless manner in which articles of food have been adulterated has called forth the stringent regulations of our national pure food law. General satisfaction with the provisions of the law has been expressed by the public, but that satisfaction is tempered somewhat by the knowledge that the best legal talent and the keenest qualities of human ingenuity are exercised in these days in finding ways to evade the law. What the ultimate result of the pure food law will be cannot now be known. Time alone will tell.

It is interesting in this connection to note the fact that in the case of comb honey the provisions of the pure food law do not, and, in the very nature of things, cannot, apply. The fact that honey is stored and sealed in honey comb is in itself a sufficient guarantee of its purity. This statement is made all the more interesting in view of the fact that it is very generally believed that comb honey can be adulterated.

Comb honey is the product of the hive bee under human direction and management. The little cells in which honey is stored are built up by the bees themselves of pure white wax. This wax is a secretion of special glands in the body of the bee. By skillful handling in the "pinchers" located in the lower part of the bee's head, this wax is drawn out to the

thinness of fine tissue paper. The cells are six-sided in shape, and, in the majority of cases, are about one-fifth of an inch in diameter. They fit so compactly together that but a single thickness of wax is needed at sides or bottom, thus economizing both space and material.

Man's care and intelligence in the management of bees is rewarded in the finished product of the hive, pure comb honey. It will add much to the enjoyment of the one who eats comb honey to know that when once the seal has been placed on the cell by the bees, it is beyond the power of man to modify the contents without breaking the seal. The seal once broken, it is beyond his power to replace or counterfeit it.

With comb honey before him, the seal of the bees intact, the lover of nature's choicest sweet may eat to the full. He knows that upon his food he has the seal of authority higher and more binding than could be placed there by any human legislation.

HOW MUCH SUGAR WILL IT TAKE?

I have heretofore wintered my bees out of doors, but will this winter use a cellar. I intend also to use **all sugar** for stores. I would be obliged if you would favor me with the number of pounds of sugar that should be fed to each colony to serve till June 1st. Should you favor me with the above information I shall be exceedingly pleased.

[The above question was sent by an Ontario bee-keeper to Mr. Wm. McEvoy, who has kindly sent it on to the C.B.J. We would like to have had Mr. McEvoy's answer. He did not, however, send it. From the tenor of the above question we take it to mean that it is the intention to extract from the brood chamber in order that the bees may have "a sugar" for stores. In that case we would say that a hive of eight Langstroth frames should have at least forty pounds of sugar syrup, which would require approximately about twenty-six pounds

of sugar to be slowly and by quired, as much feeding larva. with a rush, up, and the quantity the above might chamber is not course, the amount upon the amount combs. In which feeding them a which might be five to thirty-five syrup for winter one of water. boil. Then recool. If possible warm.—Ed.]

THE WORK OF CHARITY

We are asked as a work of charity

The Sisters of from England laquest of the Arc and the Bishops the approbation of the Catholic whose headquarters, Hintonbur our readers are a brought over from the summer n The boys are pl and the girls in d child is importe is exercised in use of good phy: istics are accept immigration. Canada usually ra but occasionally who would be in special cases placed out unc ording to their amount of wor

of sugar to each colony. If this is fed slowly and by degrees more would be required, as much might be consumed in feeding larva. If, however, it be fed with a rush, and all vacant cells filled up, and the queen's laying thus shut off, the above might suffice. If the brood chamber is not to be extracted, then, of course, the amount to be fed will depend upon the amount of honey already in the combs. In which case we would advise feeding them all they will take down, which might be anywhere from twenty-five to thirty-five pounds of syrup. Make syrup for winter stores two of sugar to one of water. Stir well and bring to a boil. Then remove from stove and let cool. If possible, feed to the bees while warm.—Ed.]

THE WORK OF THE SISTERS OF CHARITY OF ST. PAUL

We are asked to publish the following as a work of charity:

The Sisters of this Order, who arrived from England last fall, have, at the request of the Archbishop of Westminster and the Bishops of England, and with the approbation of His Grace the Archbishop of Ottawa, taken over the work of the Catholic Emigration Association, whose headquarters are at St. George's Home, Hintonburgh, Ont. As many of our readers are aware, the children are brought over from the Old Country during the summer months of the year.

The boys are placed to work on farms and the girls in domestic service. Before a child is imported from England great care is exercised in its selection, and only those of good physical and moral characteristics are accepted by the Association for immigration. The children sent to Canada usually range in age from 11 to 15, but occasionally children of a younger age, who would be suitable for adoption, in special cases sent to Canada. They are placed out under conditions varying according to their age and capability and amount of work required. They are

possessed more or less of ordinary childish faults and failings. Impossibilities in the way of perfection must not be expected. The children are selected from institutions in England where they have been under observation for some years, and in whom there is every confidence that they will do well. In fact, it is made a reward and a favor to be brought out, and great care is taken not to send children in order to get rid of them. Untrained waifs and strays are not sent out to Canada. The records show plainly that of the children sent out to Canada during the last seven years, only 4% of the boys and 7% of the girls turned out unsatisfactory. When a boy or girl shows a bad or depraved character, he or she is deported rather than be detained in the country, to be a menace to the good name which others are endeavoring to keep up. This being so, the Association is persistent in enforcing the fulfilment of the obligations assumed by an employer of one of the wards, and also requires that the child should receive proper treatment. While the Association recognizes that all children are not equally satisfactory, they require that an employer who may have an unsatisfactory child in his care return such child to the Home, where they will replace the same at their own expense, rather than subject it to treatment which might be construed into cruelty or harshness. Forms of application containing full information for the guidance of those requiring a child are readily sent on application to The Rev. Mother Superior, St. George's Home, Hintonburgh, Ont.

CO-OPERATION

[R. Beuhne, in The Australasian Bee-Keeper.]

Every industry has its periods of depression, and our own, the bee-keeping industry, is no exception to the rule. In recent years coöperation has been advocated, and in some cases tried, to overcome the difficulties resulting from such

depressions, but I am not aware of any instance in which coöperation has proved a success under the conditions surrounding "our" industry. In all the various schemes of coöperation proposed or initiated, a very important factor, that of human nature, has been either ignored or greatly under-estimated in importance.

To illustrate my meaning, let us examine the scheme of an enthusiastic advocate of coöperation. His proposal may be: First, a combination of producers binding themselves not to sell below a certain price determined from time to time by an elective committee; or, second, a central depôt or agency, through which all produce of members is sold; and, third, coöperative purchase of the principal articles required by members. When we have carefully examined coöperation under these three headings, and with due regard to the important element of human nature as it is (not as it ought to be), the deductions arrived at should enable us to see whether successful coöperation is possible, and attempt to accomplish expedient, at the present time.

Dealing now with proposal No. 1, selling at a fixed price. Assuming that an energetic advocate of coöperation succeeded in inducing a majority of the bee-keepers in our State to bind themselves not to sell below the price fixed by the management of the coöperation, there would still be a considerable number of honey producers whom even the most sanguine promoters could not hope to bring into the combination till it had proved satisfactory and of advantage to them to join. In the meantime, these outsiders would supply the demands of the market, and when their stocks became exhausted the coöperation would become coöperative were it not for supplies pouring in from other States and supplying the markets which, geographically, belong to the members of the coöperation, which would, as a natural result, break up.

Against this view it may be urged that coöperation, to be effective, must include all the States of the Commonwealth. But

who, I ask, could accomplish this task of organizing into one body producers scattered over such an immense area, with so widely differing conditions and natural resources? And how are prices to be fixed of a product such as honey, differing so widely in different localities, in quality, quantity, methods of production and distance from markets? How many members would resist an offer for their entire season's crop at a price a small fraction below that fixed by the coöperation? And what penalties could the management inflict upon seceding members? The answer to the question, Is coöperation, as so far considered, possible, and the attempt to accomplish it advisable? must inevitably be No.

Dealing next with the second proposal that of a central depôt or agency, we meet, first of all, the same difficulty, already discussed under the first heading, namely, that of organization of widely separated units; next, the inclination of human nature to take advantage of opportunities for immediate individual gain, even at the risk of future loss. Then the difficulty of finding the necessary capital, and, last but not least, the influence of centralization on the consumption of honey.

With the difficulties of organizing have already briefly dealt, and they are apparent, or should be, to every bee-keeper who has watched the efforts of the Victorian Apiarists' Association to draw together for their mutual benefit the bee-keepers of this State, so that need say little more on this subject. Our comparative failure to achieve the object we have been striving for has been due to the want of the funds necessary to initiate an organization, membership which should be a distinct advantage to the individual producer.

But how can anything be accomplished when, on the one hand, those who are to be benefited refuse to find sufficient means to make a start, although quite ready to share later on in any benefit after an enterprise has been established by other

Sept. 1908

Want and

FOR SALE—colonies, with particulars to Woodstock, Ont.

FOR SALE—(tracting), and bush, good wax stable (frame), cut 5 to 6 tons trees. Good road 6 miles, Lavan Railway. Cash BLAKE, Donal

WANTED—C State probable q up, etc. FOST Limited, Brantf

FOR SALE—for holding two walled, for single frames; made of than cost of lumber. G. A. DEA

WANTED—La light sewing at time, good pay; charges paid; see particulars.

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ALBION HOT
\$1.00 and \$1.50
HOLDERNESS,

Though
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the Fact is STRAY

Gunn, Law

Want and Exchange Column

FOR SALE—First-class apiary of 120 colonies, with all supplies. Write for particulars to J. B. HALL, Box 595, Woodstock, Ont.

FOR SALE—Bee-yard, 75 Hives (extracting), and 195 acres land; maple bush, good water, log house, new bank stable (frame), outdoor bee cellar; can cut 5 to 6 tons wild hay; 75 young apple trees. Good reasons for selling. Station 6 miles, Lavant, Kingston & Pembroke Railway. Cash, eight hundred. CHAS. BLAKE, Donaldson, Ont.

WANTED—Comb or Extracted Honey. State probable quantity, quality, how put up, etc. FOSTER & HOLTERMANN, Limited, Brantford, Ont.

FOR SALE—40 winter packing cases for holding two hives; also 24 double-walled, for single colonies, complete with frames; made of best pine; will sell less than cost of lumber. Comb Honey wanted. G. A. DEADMAN, Brussels, Ont.

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while, on the other hand, the Government declines to assist our industry, partly because we have not as yet a large surplus of produce available for export, and partly because honey producers themselves do not exhibit sufficient confidence in the prospects and the future of their industry to justify the granting of State aid to put the industry on a satisfactory basis. An earnest and determined effort to overcome our difficulties would go a long way towards gaining the sympathy and practical support of the Government. Supposing, however, that a central depôt had been established, the obligation of members to sell through it would be a moral one, and the management could inflict no deterring penalties upon a member who, for choice or convenience, or from necessity, sold his produce below the price obtained by the central depôt. This is merely human nature as we find it every day, but it is just that which would wreck a scheme such as described. To avoid this risk it would be necessary for the coöperative association to have sufficient capital so as to be able to advance to the producer on receipt of his produce at the depot up to 75 per cent. of its value. Such advances are made by commission agents at the present time, and no central depôt could be established with such a concession. Next, the current expenses, such as salaries of manager and employees, rent, interest on capital, etc., have to be considered. According to a calculation based on half the total quantity of honey received in Melbourne in twelve months (the depôt could hardly expect to handle more than that at the start), a commission of 5 per cent. charged on all sales would hardly cover the current expenses. In this respect the depôt would be no improvement on the present method of selling through commission houses.

Coming now to the question of capital, without which a central depôt could not exist, the difficulties of obtaining it would be considerable. The producers, the beekeepers, could not, or perhaps would not,

Sept. 1908

h this task of producers scattered area, with as and natural prices to be money, differing lities, in qual- production and ow many mem- for their entire, small fraction operation? And management in- es? The answer ation, as so far the attempt to must inevitably

second proposal or agency, we same difficulty, he first heading, ation of widely, he inclination of advantage of op- time, good gain, ture loss. The g the necessary at least, the influ the consumption

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ing be accomplish d, those who are find sufficient me ough quite ready y benefit after established by oth

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be likely to raise amongst themselves a sum sufficient for the purpose. To obtain the capital from outside sources securities would have to be forthcoming and a fair amount of interest paid. The only feasible way that occurs to me is to loan the necessary amount from the State, if such is possible, with trustees as security.

Finally, the effect of centralization upon consumption has to be considered. It will be admitted that honey, although it is an article of food, is not a necessary one; it can be done without if it does not happen to be on hand. A considerable quantity of the honey sold by commission agents is bought by casual buyers. They come to buy other produce, and buy some honey when it happens to offer, but they would rarely go specially to a place where honey only is sold. A central depôt would, if effective, reduce the number of channels of distribution, and thereby check the increase in the consumption of honey. Coöperation under the second heading I therefore consider inadvisable.

No. 3, coöperative buying. Of the three headings under which I am dealing with coöperation, this at first sight appears the most promising, but on closer scrutiny the difficulties become almost as numerous as in the case of coöperative selling. Very few bee-keepers could state months beforehand their requirements for the season; fewer still would or could pay cash in full on delivery of goods. Such being the case, the coöperation would require capital to have sufficient stock on hand for all likely demands. Then useless goods were sent out on credit, the bee-keeper would probably obtain his supplies from a private firm which would trust him, and take the risk of delayed payment or loss, while the central depôt would have goods left on hand, depreciating in value and becoming out-of-date. I need not go further into this subject, but again say the coöperation is not advisable.

In conclusion, I may say that I am in favor of coöperation, but of a differ-



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Yes. Not ones. The sm "show" at the merchants, and in the iron-be County, Minne cash that exc These iron-be makers for tho are situated ir. which lies alo Railroad betw erd.

End of Ore I

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Your Opportun

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Big Fortunes Are Being Made In Minnesota Iron Lands

Yes. Not only big fortunes but little ones. The smaller people are getting a "show" at the great profits. Farmers, merchants, and others who have money in the iron-bearing lands of Crow Wing County, Minnesota, are getting profits in cash that exceed their fondest hopes. These iron-bearing lands are money makers for those who take out ore. They are situated in the Cuyuna Iron Range which lies along the Northern Pacific Railroad between Deerwood and Brainerd.

End of Ore in Some Old Sections

Although \$1,500,000 in dividends were distributed this year to the stockholders of only one company in Northern Minnesota, still the indications are that the iron-ore in older sections is getting scarcer and scarcer every year. New mines will have to be opened in greater numbers than before in other sections.

Your Opportunity—Our Proposition

This then is your opportunity. Many consider it the chance of a lifetime. We control a quantity of iron-bearing land in Township 46, Range 29, Crow Wing County, Minnesota. It is but 3 1/4 miles from Deerwood, a town on the

Northern Pacific Railroad between Duluth and Brainerd.

A Rich Strike Nearby

A short distance North of this property a prominent ore company has sunk a shaft and is now mining. In every direction drills have disclosed valuable finds of iron ore. Within 80 rods of this land drills have blocked out forty million tons of iron ore. The above ore company referred to has offered to supply us with money and take half the profits. We prefer, however, to develop it ourselves and divide the profits among those who invest with us in this valuable land. Consequently, we believe it will be an excellent opportunity for you to receive good dividends on your investment.

We are an organized corporation, capital \$150,000.00. The price per share is \$10.00 each. Our prospectus and other literature give full description of the property with pictures, guarantees, references, map, and everything that it is possible to put on paper which reflects an honest, straight-forward and reliable investment.

A visit to these lands will well repay you. Send for above prospectus quick, and ask us any questions if you feel inclined to. We will give you an honest, straight-forward answer.

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Minneapolis, Minn.

kind; that I admit that my arguments are destructive, but that I hope on my return home to be in possession of such information as may enable us to attack our difficulties with a better prospect of success.

[Yes, friend Beuhne, coöperation is one thing on paper, but a very different thing in reality; it is one of those delusive fads that usually take possession of most newcomers into all industries. Whilst the theory and principle of coöperative societies is good, the usual practice is bad, because it is impossible to secure the undivided support and loyalty of the majority. In fruit production coöperation has proven to be a failure, simply because those who could have made it a success were not in it, and they were "the majority." No matter what is tried, it seems to fall to the ground in the long run (usually the short one). Coöperative wool selling has been tried, and many schemes in different industries in many parts of the world, as well as our own,

but they have in nearly every instance been found "wanting." Their effect on sale prices has been infinitesimal, and the venture leaves the shareholders with long faces, but lighter purses, and they end up wiser but sadder men.—Ed., W. L. D.]

Vaudeville at the Fair

A splendid program of vaudeville will be given daily in front of the grandstand at the Central Canada Fair, Sept. 18-26. There are to be ten numbers, as follows: Looping the death-trap loop by A. C. Holden; Ahearn Troupe of amusing cyclists; Mlle. Desvall, with her trained horses and dogs; Monte-Myro Troupe of fun-making acrobats; La Nole Bros., comedians and gymnasts; Delmore and Oneida, equilibrists; Nelson, the great high-wire walker; A. C. Holden, in a thrilling dive into a tank, from a height of 100 feet; balloon race, with triple parachute descent from each balloon by Prof. Ed. Hutchison and companion. In addition every day before the grandstand will take place the parade of horses and cattle. There will also be trotting and running races and a band concert.

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They are good honey-gatherers—having given me good crops even in poor seasons.

MR. WM. McEVOY, who has ordered a large number of these queens each year, for several years back, writes:—"I don't consider that your Queens have cost me a cent. They more than pay for themselves every time."

I am already booking orders from extensive bee-keepers who have tried the stock in former years and are well satisfied with it.



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W. H. L

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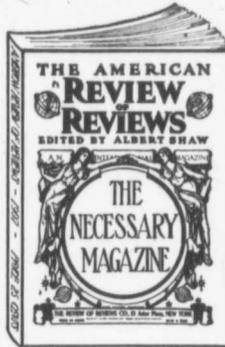
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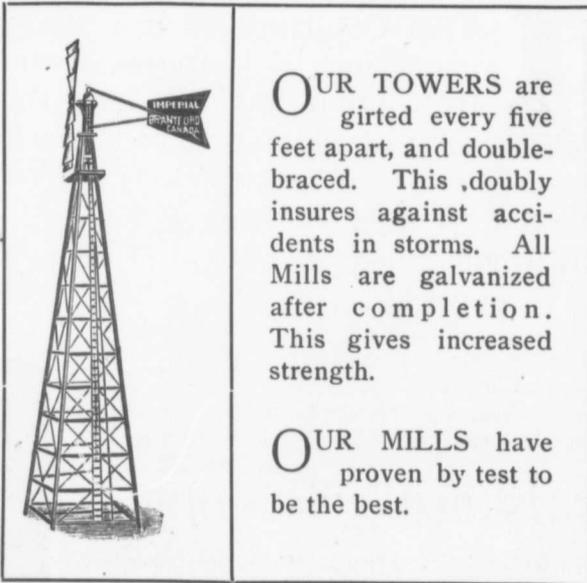
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