Bee-keeping for Farmers.

[Prof. A. J. Cook, Michigan Agricultural College.]

Bee-keeping has been called the poetry of rural pursuits. There is something very interesting and attractive in a well-kept apiary. The scores of neatly pointed hives, arranged like the squares of a city, or the blocks in a garden, upon a rich well-kept lawn—that matchless carpet of nature's own weaving—under protecting shade, it may be of a beautiful well-trimmed grove, is indeed a fascinating sight. The incomparable sections of immemorial comb honey, as they are taken from the hives, are sure to win praise and admiration. To taste this nectar, fit for the gods, as it roofs over the flaky biscuit at the evening meal makes one even more loud in praise of the honey bee and the bee-keeper's art. To see this much and naught besides would convert any one to the poetical view of apiculture. It is also said that "bees work for nothing and board themselves." Surely there is much to admire in such employees. I fear it would be more true of many hired laborers in these days, to say that they do nothing, and expect board and washing thrown in.

But the reality of bee-keeping like the reality of every other important industry is not all poetry. There is that "business end of the bee" as one American humorist styles it, which, though little feared by the experienced bee-keeper, is not exactly poetical nor are poetical utterances the kind it calls forth.

The woodman's axe, that fell destroyer of our forests, has let lose the sweeping winds, so that our winters have become terrible in their severity. The bees—natives of a warmer clime—cannot endure the rigors of our late winters, and often whole apiaries are swept off by this besom of destruction. Surely it takes a veritable Mark Tapley to be or feel poetical not to say jolly as he sees his all swept away as by a tornado.

Again, bee culture is no idle pursuit. True the labor is not excessive for much of the year. Yet no business demands more prompt attention, and during the busy season, from May to September, the bee-keeper must work with all his energy. Nor is the call for mere machine work. Earnest thought, close observation as well as hard physical effort are demanded to win success in apiculture. Let any intelligent person thoroughly prepare himself for this business, and the study which this requires will be its own reward. And then if he combine with this the qualities just named, he may feel assured of success, and find in the apiary as pleasant and as profitable employment as is to be found in any other of our manual labor pursuits. And the credit of this industry, be it said, that the capital it demands is far less than that of any other branch of agriculture.

In the brief space of an hour's lecture, I cannot give even in outline the wonderful life history of the honey bee, nor portray the marvelous economy of the hive; nor yet can I describe the various implements which aid to bring success to modern apiculture; or detail the methods and operations which bridge over disaster and loss, and surely wins success in this fascinating pursuit. Indeed it is not well that I attempt this; the many admirable bee books do this to perfection; while the numerous excellent periodicals keep every live, reading bee-keeper, the only ones that succeed in these days of low prices and sharp competition, thoroughly informed as to the newest discoveries and latest improvements in this, perhaps the most progressive of the arts. I shall the rather speak of the great importance of this industry and explain why every farmer and horticulturist is or should be vitally interested in the success of bee culture in his own neighborhood, even though he may never own a single colony of bees, or taste a drop of honey. I shall also show that bee-keeping may become a valuable adjunct of the farm, and shall endeavor to explain how and when it will fail of success, and how and when it will succeed; hoping thus to add not a few to the long list of successful apiculturists that are now doing honest, valuable service in the nation's great industrial work shop. I may also do the no less important service, that of tettering some from entering this field of labor. Persons who are not fitted for the work, or cannot meet its requirements, and who if they undertake it will only win loss and disappointment.

There is no fact in science better established than that of insects to the full fruitage of many of our most valuable farm trees, vines, grains and vegetables. Many of our plants like those forming that most valuable field crop, the clover, will almost fail to produce seed, except
that insects act as “marriage priests” and bear the fructifying pollen from anther to stigma. Even in plants like the clover, where each flower bears both male and female organs, we find that nature has so ordered that unless insects can effect cross fertilization the development of seed will be scant, and often times fail entirely. In many plants like the squash and pumpkin the anthers, with their burden of pollen are in one blossom, while the stigmas which must receive the fertilizing dust is in quite another. Here even the novice need not be told that without insects to bear the pollen from stamen to pistil no fruit can develop. As you all know most of our very finest varieties of strawberries are pistilate. You practice on the knowledge that staminate varieties must be close at hand; but even this would not avail except that insects come to bridge the distance from one kind of bloom to the other. True, most of our fruits and berries arise from perfect flowers; yet it is a thoroughly demonstrated truth, that we can never secure more than a meager crop except that insects swarm upon the blossoms in quest of pollen and nectar, and thus while the Liliputs of the animal world are busily gathering their own livelihood, they are also, at the same time, giving to the vegetable world a rich return for the good they receive. In the grand economy of nature, the insects and flowers are not only companions, but they are mutual friends, eye more than friends, each is the savior of the other. The plants save the insects from starvation; while the insects return a no less valuable service, in that they protect the plants from sterility.

Chief among these insect friends, especially in the early spring when nearly all our fruit trees and vines, and many of our vegetables are in bloom are the honey bees. Most other nectar-loving insects, like the wild bees, the wasps, the two-winged flies and the flower berries, are all unprotected against the storms of win or, and myriads of them succumb to the rigorous blasts. Even those that do survive live solitary or in pairs, and increase so slowly, that their accomplishments, at least till quite late in the season are quite insignificant. Not so the hive-bee. From its very nature and habits it is housed against the chilling blasts of winter, and thus comes forth at the awaking of spring fresh and vigorous. Again, bees do not live solitary or in pairs, but in colonies, each numbering thousands, and thus even in the early spring time, myriad bees come forth to greet myriad flowers.

You have all noticed that red clover will not seed only very partially from the June blossoms. You all know that there is no such failure with the second bloom that makes fragrant the fields of July and August. It is well known that our hive bees do not work generally on the red clover. The flower tubes are too long for the hive bee’s tongue. Hence the red clover is dependent upon theumble bee for fertilization. Early in the season when the first red clover bloom adorns the meadows,umble bees are very few and entirely inadequate to the important work. Later they have increased and by the time of the second blossoms, they fairly swarm upon the flowers, the cross fertilization is effected, and the farmer rejoices in a bountiful crop of the valuable seed.

Red clover was introduced into Australia and New Zealand, and as there were no bumble bees there, even the second crop of red clover failed to produce seed.

Within a few years bumble bees have been taken from England to these far-off colonies, and now the clover is commencing to yield seed, as you all know, the first crop of white and Alsike clover seed, readily from the first bloom, and all bee keepers know that the most abundant and beautiful honey crop comes from these same clovers. Could we breed a race of bees that could work generally on red clover, we should not only bless the bee keeper, but the farmer as well. Dr. Beal, who has experimented largely in this matter of cross-fertilization, has suggested to me the importance of experiments looking towards the protection of our humble bees, so that we might start off early in the season with a generous supply of these valuable friends of the husbandman.

A few years ago the bees were generally destroyed near the gardens of one of the most noted seedsman of Massachusetts. The next season this gentleman was astonished with a very meager yield of squashes, melons, etc. Surprising that the absence of bees might be the cause of his failure, he secured a number of colonies, since which time his success has equaled his fondest hopes. Only last month I had the pleasure of addressing the horticultur-
ists of Ohio at their annual meeting in Dayton. I took occasion to urge this very question of the importance of bees to the horticulturist. Mr. Farnsworth, an extensive grower of small fruit in Lucas County, near Toledo, reported that a few winters ago the bees of his neighborhood were very generally destroyed. The next season his crop of fruit was very disappointing. He was very positive that his ill-success was owing to the absence of bees and the consequent lack of fertilization. Not one in that large audience of intelligent fruit-growers but what praised the bees as a valuable adjunct in fruit culture. It sometimes happens that cold or storm during the time of fruit blossoms in May keeps the bees shut close in their hives. Such an occurrence warrants the prediction of a light crop. Many a pomologist has been puzzled to know why so little fruit would set in occasional years after a most bountiful season of bloom, not dreaming that the key to the solution lay in this very matter, of failure in the flight of bees during the blooming period. Our point then is just this: Every farmer and horticulturist is directly interested in the success and development of bee culture in his immediate neighborhood, for its success is his success.

I need not say to any such audience as will come out to these Wisconsin Farmer's Institutes that bees never in any way injure the flowers that they visit. They are always and entirely beneficial. Nature would never have added the attractive coloration, or spread the rich feast of nectar, only that the flowers needed the bees. Whenever you see a beautiful flower, or the pearly nectar drop that bathes its corolla cup, or enjoy the delicious perfume that is even sent out to call the bees, you may be sure that such bloom needs the aid of insects. These are the distress signals they cry out to the passing bee, "love or I perish."

It is true that our large Carpenter bees do sometimes pierce the long flower tubes of such plants as wild bergamot, that they may reach the hidden nectar. But from very long and close observation I feel quite certain that the honey bee never does this. Even this slight tearing of the corolla is no damage to the flower or plant practically. The showy part of the flower, as we have seen, is only a signal, and when the bee comes its work is done.

Again, bees never disturb our stock while it is grazing, though one Wisconsin farmer at least has thought to the contrary. Every close observer knows that no bee in its quest for honey, or while sipping the nectar, will volunteer an attack. Hence, a bee in its foraging tours in the fields will never sting unless pinched. It is absurd to say that bees ever drive sheep or cattle from pasture. If you ever see any actions that lead you to think such may be the case, look for the bat flies. The sheep bat fly which lays its eggs about the nose of the sheep, and the cattle bat fly which deposits along the backs of the cattle, often annoy these animals seriously, and will cause them to rush about the field in wildest excitement. These flies are about the size of bees, and look not unlike them, though they have but two wings; but their evil deeds must not be laid upon the shoulders of the honey bee, for its work is of an entirely different type.

Another truth is equally potent and quite as thoroughly established. That is, that bees never injure sound fruit. Even though the anatomy of the bee, did not refute this oft repeated charge their nature and habits would assuredly do so. The bees are not like the woodpeckers and titmice, that go chiseling about for their food. The bees never bore for their sweets, but always sip from the bottles that nature hand out to them, and which are always uncorked by the same friendly hand that proffers the gift. If anyone ever states in your hearing that bees puncture grapes, or bore into any fruit, you may give the assertion unqualified denial. True, if bird or wasp, or as is more generally the case, dame nature herself breaks the skin, so that the rich, sweet, juice begins to ooze out, then the bees, true to their instincts, which abhorre waste, rush to the wounded fruit that they may gather the nectar and bear it to their hives.

As every grape grower well knows, this fruit is very liable to bleed if it becomes very ripe, and then is confronted by any hot, damp, or sultry weather. This accounts for the fact so frequently noticed that bees often rush upon a vineyard at the time of vintage as with one accord. It is at just such times the bursting fruit and oozing juice call all to the banquet. Does this look as if
the bees have turned into miners? Then one or two wise ones with sharper tools would be seen plying their new vocation, and not a whole apiary wise all at once.

The only just complaints that can be laid upon our friends of the hive are these: Often at the time of the vintage the grapes will burst, and the bees will swarm upon them. The vine grower may still find it profitable to secure the grapes for the purpose of wine making, and finds the bees an insufferable annoyance. Hidden among the clusters, they are not perceived by the pickers and stings innumerable will be the cost of picking the grapes. Again, to many the dread of being stung will be almost as terrifying as the stings themselves. Again, if grapes are placed in the sun to dry, for raisins, the oozing sugar will surely attract the bees. In such cases the bee will greatly injure the fruit. Lastly, if bees are placed very near the street, unless a barrier of trees, or a high closed fence separates between bees and the street the bees may sting passers by and provoke anger, and perhaps cause serious loss. The first case, annoyance at time of picking the fruit, is not serious, as it happens only on occasional years, and then only at rare periods, when the ripeness of the fruit and the sultry heat combine to crack the grapes. In such cases the grape grower can do much to protect himself by keeping his fruit closely picked. The bee keeper should read Romans's twelfth chapter, eighteenth verse: "As much as lieth in you live peaceably with all men." If possible the bees may be shut in the hive or removed for a few days to a cellar. Some of the nicest comb honey should be sent as a present to the grape grower at just this time. And it will pay well even for the bee man to help pick grapes for a day or two. He can show how it may be done with the least danger from stings. And as we all know it takes a very vicious man to carry on a quarrel where his antagonist is all kindness and love. In case of the raisins they should be dried under cover. The bee man can assert his rights, for the bees had possession before the raisins were thought of. Surely, if both parties are good Samaritans, they can arrange to remove the difficulty, and each carry on his business, and yet be neighbors and friends. "Where there is a will there is a way."

I have already suggested a way to keep bees close by a street or much traveled thoroughfare. A close thicket of trees between bees and streets will look well, and will so direct the bee's flight upward, that their near presence to passers-by will cause no fear or annoyance. In case the trees must be grown, a close board fence, though not a thing of beauty, may be endured, for a short time till the trees are grown and will answer the same purpose. Sometimes early in the spring the bees will spot the clothing on the line. When such snow-white clothing made clean by my wife's hard effort, and while on the line spotted, as I have seen clothes, I confess, I should feel provoked. In this case the bee-keeper may talk over the danger with his neighbor, and may discuss some fine honey presented at the same time, and find out the time in early spring when the clothes are to be exposed, and see to it that the bees are shut up at such time. In the spring time there is little danger from the hives, as at this season the bees are too few in numbers to receive harm even if the hive is closed, especially so as the weather is rarely very warm. The main thing is for us to possess the true neighborly feeling, and then I feel sure that bee men and grape growers can live peaceably side by side. Indeed, as we have shown, they must live side by side even for the fruit man to receive the full fruition of his labors.

WHEN SHALL FARMERS KEEP BEES?

If, as we have shown, the whole country is benefitted by the presence of bees, then surely farmers may well enquire into the policy of making bees a part of their possessions.

Some of our best apiarists claim that only specialists should keep bees. The arguments they use are these: Bee-keeping demands thorough preparation. Such will only be given by one who makes apiculture his special business. Again, success in the apiary will brook no neglect. People in other walks of life are busy and so will neglect the bees. If we grant the second premise in these arguments there is no escape from the conclusion. But I stongly deny "its truth." Among the very best bee-keepers of America, men who have grown wealthy in this pursuit, and have honored the calling by the skill, and in-
telligence which they have shown in the apiary, are doctors, ministers, mechanics, farmers, teachers and even lawyers. Truth is even stronger than theory. And so long as some of our very best bee-keepers are men who are amateurs, or only make apiculture an avocation—indeed some are ladies who, besides caring well for the work of the house, carry on the apiary with a skill and efficiency that takes off its hat to no one, not even these boastful specialists. So long, I say as such is the case, I can never accept the view that only those who make bee-keeping a specialty shall enter the ranks.

But it will be asked: Do not many attempt bee-keeping and utterly fail of success? What say the empty hives piled up behind so many farm-houses, if it be not failure, and so we do well to ask why the failure?

There are several requisites to success in bee-keeping, the neglect of which will bring failure as surely as a dissipated life brings want, distress and ruination.

First, no one should keep bees who is so susceptible to the poison that to be stung means pain and distress for hours afterward. Some people are so affected that if stung on the foot the eyes will swell shut, the flesh will become inflamed and the whole body will be feverish for many hours. Every bee-keeper will occasionally taste the "sweet uses of adversity," in the shape of stings. If then the sting is so severe, bees and bee-keeping should be given a wide berth.

But here it should be said that one person is no more liable to be stung than is another, except as he is more nervous, and so is less self-possessed. Experience will allay the nervousness, and remove the susceptibility. Again, one may be very nervous about bees, and by working among them lose all the fear, and care no more for their presence than for that of his cow or horse. Here I speak from experience. I love the study of bees, and would watch and handle them, though at first I was in mortal dread of the stings. Now I think no more of danger than would I, were bees stingless. Again, bee venom, like most poisons, as recent investigations are proving, may innoculate a person so that he is less and less affected by stings. This has been also been proved by my own experience. When

I first commenced working with and studying bees a sting would swell badly and was severely painful; now the stings rarely swell at all, and I may be stung two or three times, and in a few minutes cannot even tell where I received the stings. This is the common experience of apiarists. It should be said here, that persistence in handling bees soon gives one confidence, removes nervousness and makes the danger from stings almost nothing. Again, no one should commence apiculture until he had become thoroughly acquainted with the science and the art. One of the charms of the business is that it is founded on science, and its labor must ever combine the mental and the manual. He, then, who is not willing to study thoroughly the science of bee-keeping should remain outside the ranks. It is to the credit of agriculture that one may eke out on the farm a precarious livelihood and know very little of the technical operations required on the farm. In apiculture so much depends on accurate scientific knowledge that success can only be reached through study. This may be got speedily through the hard, close study of books, or by the longer, more tedious road of experience, which, as in all other cases, involves vexation and loss. Lastly, apiculture demands the punctual keeping of engagements. Neglect is the rock on which many an apiarist is wrecked. If your farm takes all your time and energies then don’t undertake bee-keeping. If any of you like bees, will thoroughly study the subject, and this will pay you in the fascination of the study. As the natural history of bees is so full of interest, that he must be dull indeed who does not find a rare charm in its study; and lastly, if you can find time to attend to the wants of the bees, which of course will be gauged in amount by the number of colonies one keeps, then you do well to add apiculture to your farm, shop, or profession. When you may find, as has often been the case, that your bees pay you better than even your regular business.

A HINT WORTH CONSIDERING.

It is often a vexed question, "how to keep our boys on the farm." Usually the question comes with most force and significance when the boys are between the ages of twelve and eighteen. Show the bright farm boy who so loves his home that it requires real persuasion
to induce him to leave it, even for an hour; the boy whose evenings are spent at home, because he rather be there than anywhere else, and I will show you a boy who maketh a glad father, and rejoiceth the heart of his mother. A boy who will make a success whether he stay on the farm or where'er life takes him. I know intimately just such a home. The father has a large, well-stocked farm and two boys. As the boys were about to cross the bridge between childhood and youth, the father secured some fine, pure-blood fowls for one of the boys and a colony or two of bees for the other. He purchased two or three of the best books treating of poultry, and the same of bees. A good journal was subscribed for treating of fowls, another of bees. That winter the books and papers were thoroughly studied and discussed by father, mother and boys. Who shall say that this study and the interest it awakened were thrown away, even had they had no practical results? One of those boys is now eighteen, the other is fifteen, and either one will discuss bees or poultry as intelligently as any bee man or poultry fancier of the country. More, either boy is qualified to take charge of and manage successfully a large apiary. Granting that there had been no income from the bees, would any one say that the course of that father had been foolish? I tell you that father rarely thinks of his bees that he does not think of the boys, and methinks he often whispers "blessed bees." But now as to the results: The bees increased without the loss of a colony until eighty colonies adorned the bee yard by the orchard. Until last winter not a colony was ever lost in wintering, and then only because the advice of a celebrated bee-keeper was followed, against the judgment of the owners, and the cellar was kept at too high a temperature. Even then the loss was not great. In 1884 and 1885 the proceeds of these bees exceeded the income of all the balance of the farm. And yet this is one of the best tilled and best managed farms in Wisconsin. The capital invested in the farm, stock, tools, etc., cannot be less than $10,000 or $12,000. The capital invested in the bees is not more than $1,000. And the bee business has grown up without a dollar's outlay since the first purchase, except as the money came in from the bees. From the first the bees have far more than paid all expenses. The wise advice insisted upon in our best books, to go slow was strictly followed, and no bee have never been purchased since those first colonies, except the purchase of a few queens.

Others have interested daughters in a similar way, and at the same time have secured for the girls labor in the open air, and healthful exercise, which in itself has paid for all the expense and labor, even were it not richly paid in the money income. I know of a mother in Michigan—one of the best bee-keepers I ever knew—who commenced to keep bees solely for health's sake. To quote her own words, she has found health, and secured a good profit on her investment and labor. Can any of you meet with the same success? Not one of you but what can. If you will fit yourselves with the same studious care and then exercise the same diligent pains-taking effort to meet every requirement of the bees with absolute punctuality.

It only remains to be said that honey is just as sweet, just as wholesome and just as valuable a food as it was in the olden time when the "Promised Land" was lauded as a "land flowing with milk and honey." The bee-keeper, besides contributing to the value of farm, garden and orchard, besides engaging in a healthful, pleasant, and remunerative vocation, is also adding to the wealth of the whole country in securing a valuable food, which, without his care, energy and business thrift, as expended in the apiary, would be lost to mankind, doubly lost, for as we have seen, it has a double mission: It blesses man through the bees and through the plants.

A. J. Cook.

Injurious Insects and How to Fight Them.

[Prof. A. J. Cook, Michigan Agricultural College.]

This subject of injurious insects, to which I have given much study, is one of tremendous magnitude, whose importance is rapidly growing as the years go by. We are taking the natural food plants from our native insects, as we clear away the forest's brush wood, and the more humble herbs of fen and upland. And the insects, bent on getting