scrubbed with weak lye, at least once in two years, all over the trunk and branches. This removes the bark lice, prevents borers and other insects from laying their eggs in the bark, and stimulates the growth of the tree.

On the subject of spraying, there is a difference of opinion as to the results obtained by those who have tried it extensively. However, if properly done, and at the proper time, it is no doubt efficacious in preventing, to some extent, the ravages of the codling moth and fungus scab. Prof. Baily, of Cornell, N. Y., advises the keeping of sheep in the orchard, after the trees have attained bearing age; sufficient animals to be kept to keep down all grass and weeds and eat all wormy fruit as it falls; some other food to be given them as well, such as bran, oil cake, etc., and thus fertilize the orchard by their droppings. This is his remedy for the codling moth, and for keeping up fertility as well. I am inclined to think it would be more effective than all the spraying one could do. But the trees would need to be high standards—very high indeed, or when the trees were laden with fruit, the sheep would not bother with wormy, dropped apples, as long as they could reach the others. But why not use hogs instead of sheep? I think they would be just as effective, and could not reach as high to get at the fruit of laden trees. Besides, they would do a good deal in way of cultivation, by rooting over the ground. With respect to the efficacy of spraying for fungus, there is such a difference of opinion and experience on the subject that it is difficult to arrive at any definite conclusion on the matter. Some seasons it is not necessary, as we have clean fruit without it, and we owe it entirely to the peculiarity of the season; the weather at no time during the season being favorable to the propagation of the spores of the fungus. Other seasons, in spite of all the spraying we can do, we will still have a large percentage of scabby fruit, although some report a great degree of success in the use of fungicides. Prof. Saunders proposes to carry on a series of experiments, in order to determine more definitely the efficacy of fungicides in preventing damage to apples by the fungus scab, and when the Professor takes anything of that kind in hand he does it thoroughly, so that we may expect some valuable information from this series of experiments. But as an ounce of prevention is worth a pound of cure, I would advise planting and growing as many valuable market varieties as possible that are not susceptible to the disease—and there are many. Lastly, in putting up for market, let the packing be up to the mark, or all our trouble will be in vain. Every large grower might as well market his own apples as to let anyone else do it; but whether he does or not,—whoever packs them, let the middle as well as the ends of the barrel be according to brand. Keep up our reputation, and there need be no fear of the future of this important branch of our agricultural industry.

Irrigation.

When irrigation is spoken of the idea generally conveyed is that it is a process only applicable to arid plains or elsewhere in the far West, where little or no rain falls during the summer months, little thinking that it might be made use of on many of our own farms, especially on the garden plots. Perhaps no one suffers more from drouth in this country than market gardeners; we therefore appeal especially to them to give this matter their thoughtful consideration. It seems not too much to say that in four summers out of five the rainfall through July, August and September is far too light to enable a gardener to grow more than half the crop that sufficient moisture would enable him to produce. Colman's Rural World records a Nebraska man's experience, which we give, as it looks reasonable and applicable to ordinary conditions:—

"A 14-foot wind-wheel is used, with an eight-inch pump, that throws 4,400 barrels of water per day in a medium wind. Two reservoirs are used, one 60x150 and the other 80x150 feet. With this plant fron ten to fifteen acres can be watered. He claims that reservoirs are necessary so as to have a larger volume of water whenever you irrigate. By this means more pressure is obtained and more land can be watered and in a very short time. There are places where reservoirs would be quite in order, where a non-leachy soil can be obtained in which to excavate the necessary space. In such a case, the following method may be adopted: By means of a plow or scraper take the earth from the inside dimensions, and use it for banks. When the work of construction is completed, allow the water to enter slowly; at the same time use horses to tramp the entire bottom into a soft mud, two or three inches deep. This will close all the pores of the ground and stop very nearly all the seepage. The whole outfi should not cost more than $250."

In localities where the soil is of a leachy nature, tanks, such as usually accompany wind-mills, will answer the purpose well. This has the advantage of being able to be raised as high as desired. In irrigating fruit orchards, berries, vegetables, etc., furrows or small ditches should be used, instead of flooding the land. On a ten-acre plot of fruit and vegetables an irrigating outfit will pay for itself in one dry year.

The Flower Garden—Preparing for the Fall.

Many of the flower beds that are now very beautiful will soon become bare and unsightly, except something be done at once to fill the vacancies which will be caused by the first frost. The garden can be filled with plants whose flowers will withstand the first frost and remain beautiful until December. Provision should be made for these when the garden is looking its best. Pansy seed should be sown while the bed is in full bloom; they will then afford a splendid show quite late and come into early blooming next spring. Mignonette, too, should find a place in every spare corner where the earlier plants are sure to drop out as soon as their work is finished. Calendula, of which seed has been scattered in vacant places, will have an opportunity of showing its usefulness when the frost has destroyed nearly all else. The Cosmos will not bloom till quite late, no matter how early it is sown. It will endure a few degrees of frost, and, with a little protection, will enhance the beauty of Indian summer. In the craze for the new chrysanthemums, the old hardy sorts are quite apt to be forgotten, which should not be the case, because they will answer the purpose of bed culture much better than many of the new varieties. Fall bulb catalogues will soon be making their appearance. Secure early copies and make a study of the sorts offered, in order to get selections a little later on.

POULTRY.

Poultry on the Farm.

BY MRS. IDA E. TILSON, WEST SALEM, WIS.

"Now what is wrong?" the fancier cried,
As one more chick lay down and died—
Lice!

"And why no eggs?" the housewife said,
"And why is this young pullet dead?"—
Lice!

And thus it goes, and thus it will,
Until you find a way to kill—
The Lice!

—*Woman's Farm Journal.*

During my recent Institute work through Minnesota, I met with great interest in poultry, and, on an average, better hen-houses than I expected, but found considerable need to explain the necessity of often cleaning houses and inmates. There are living on hens three kinds of pediculidæ, or lice—grey, yellow and tawny; with three acarina—the red mite, infesting nests and walls; that microscopic mite which burrows into the crevices between the scales of legs, causing what is called "scaly leg," and another mite, as small, which works at the base of feathers and on scales of the skin. Besides these, there is sometimes one of the hemiptera to fight, namely, the common bed-bug, brought, perhaps, by martins and other swallows. When the above parasites were all identified and named, I thought their long scientific names would kill them, but they did not. According to good scientific authority, none of them, except the last, and possibly the red mite, have any disposition to feed on man; therefore it is very easy to keep ahead of them, if we only once get ahead. When I first began poultry culture, I knew nothing of their existence till my fowls and houses were somewhat overrun. I have, accordingly, tried both plans—keeping clean and not keeping clean—which some readers have not; hence I know the value of the former course. If parasites devour our fowls, we are really feeding the former,—actually toiling and sweating to raise wheat for them. Egg-making is hard work, so biddy cannot do that and support a crop of parasites, too. Spurgeon says: "Hundreds would never have known want if they had not first known waste." Wasted food and want of eggs are often found associated. Learning to make every bit of food and labor count and bring its profit is the art of poultry culture.

At one Institute a woman who had been very successful with poultry, but this season experienced an almost total lack of eggs, having one hundred hens and only from three to twenty-five eggs daily, came to ask my advice. The fowls were not present, nor was I a clairvoyant, so, Yankee like, had resort to questions. I found thereby that the hens did not, in her opinion, suffer from lack of green food, of grit, or of exercise, nor from inbreeding, concerning which I was convinced on hearing that the eggs hatched well in spring. Finally I learned that the preceding year her hen-house was new, while her present fowls were then pullets, and discoved the house had not been cleaned at all. When it was new, and the fowls were young and active, they were naturally little infested. I, therefore, prescribed a thorough whitewashing of house, which was promised, a good dust-bath for the fowls and a careful culling of the flock, to make room for her chickens. After trying, as for sawdust, a perforated pan, then an old steamer, I, myself, finally use a coarse sieve from the fanning mill to sift my ashes. The coal clinkers and the wood charcoal, thrown out by themselves, are both good eating and medicine for hens, but, mixed through ashes, they cut the hens and prevent their taking as effective a cleaning. The dust-bath is to a fowl what the mud-bath is to a pig, or the water-bath to man. Freely and constantly supplied, biddy will mainly rid herself of pests. The other day, when at the hen-house, I saw a pretty sight,—three hens in one dust-box, two in another, with a third waiting bird perched on its edge. Their appreciation of my efforts to provide dust-baths pleased me.

At another Institute I found a man who, during three years past, from his 300 hens, had gotten the groceries and clothing for a family of five, and whose reputation as a poulterer was extensive and excellent in his vicinity. He practiced whitewashing once a month. When I suggested movable nests and roosts as the secret of easy and thorough cleaning, he saw the value at once, though he had never happened to think of it before. Fortunately, most of the best principles and plans are simple enough when we once learn them. Like a boy who said to a companion: "That is my father," pointing out the man; "Do you know him?" The second boy replied: "No." Said the man's son: "Why, I known my father just as easy as can be."

With movable furniture, so conducive to thorough cleaning of hen-houses, twice a year will answer farmers very well. I saw one house with small dry goods boxes for nests on tables, and poles in grooves, but, alas, in spite of such convenient and adjustable arrangements, the walls had never been whitewashed, and there were some sick chicks, about which my opinion was asked. At still another place, a gentleman asked the familiar question: "What ails my hens?" Their symptoms, whirling around and falling down dead, were like apoplexy. Before I mentioned showering the head, I inquired about the bowels, and found their condition all right, with appetite natural. I thought insufficient food with chills might be the cause, but the amount fed was liberal and varied, and the hen-house, as he told me, was in one corner of his barn, evidently a warm location. Nothing remained but to prescribe a little less grain and to ask about the cleanliness, when it came out that the quarters had never been cleaned, and the barn became so old its owner was planning a new one. Another poulterer, a lady, came several miles to attend, and ask the cause of failure in egg production, when feeding liberally and regularly. "What more could I have done?" she cried, "and, unless they do more for me, I have decided to give fowls up." She was evidently "killing with kindness," feeding so much they were laying on fat instead of making eggs, and I felt sure her quarters and pullets needed looking over, too. People have frequently said: "There are none of these pests in sight." Yes, because their deeds are evil, and they seek darkness rather than light.

Random Notes.

BY JOHN J. LENTON.

Without cleanliness in the poultry house, all efforts to produce the best results are fruitless.

Give early chicks a little extra care, as they may be prize winners.

Keep plenty of fresh water before your fowls, and prevent them from drinking from stagnant pools.

Remember that shade is essential in hot weather, and you cannot expect good results without having it in all your yards.

If you never have bred fancy poultry, now is a good time to start, as good stock can be purchased at reasonable prices.

Market your early hatched chicks as soon as possible, as they will bring as much at ten weeks as they will bring six weeks later.

Give young birds the double benefit of dry quarters, free from vermin One means health and the other means freedom from worrying. Both mean eggs.

We believe the selling of young chicks, instead of eggs, will prove more satisfactory to breeders, as the buyers can then secure the new stock without running the risk of not getting anything for their investment.

Do not try to raise twice as many chicks as you can care for. Fifty chicks, well cared for, will bring better results than 100 neglected ones, and not cost near so much.

Did you ever see a hen's teeth? If not, look for them in the gizzard when next you kill a fowl. You will find them in the form of gravel and grit. Don't refuse your fowls a good supply of teeth.

Wheat, bran and skim milk are each, chemically considered, quite close in resemblance to the white of the egg, which fact suggests their use in the food for laying hens.

The hatching season is over, and good breeding stock can be bought for less money than at any season of the year. Those who want to start in the fancy business will do well to get their breeding stock now for another year.

A dairy farmer will get up at 4 o'clock, clean out his stable, feed, milk, market the milk daily, make up the bed and milk and feed again, with a bare profit; but it is hard work even to clean out a poultry house once a month for some folks.

A damp roosting place is an abomination, and yet fowls prefer a wet roost, free from lice, to a dry one covered with vermin, which sap their blood and strength. This will explain why some people's chickens prefer to roost on trees.

Don't allow birds with serious faults to go into your breeding yards under any circumstances. You can't breed out bad points by doing so. Of course our breeding pens are not faultless. Such pens do not exist. But we must breed only the best if we want to get first-class stock.