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Nature's Diary.

BY A. BROOKER KLUGH, M. A.
Birds on the Farm—3.

One of the prime requisites in attracting birds about our homes is the provision of suitable nesting sites. The requirements of the various species in this respect are very different. Many species, such as the Warblers, Chipping Sparrow, Catbird, Brown Thrasher, Song Sparrow, Cuckoos, etc., etc., require bushes in which to build; others such as the Oriole, Vireos, American Goldfinch, Hummingbird Purple Finch, Junco, and some of the Flycatchers need trees in which to construct their nests, while the Bluebird, House Wren, Tree Swallow, Nuthatches, Chickadee and the Woodpeckers require cavities in dead trees or hollow limbs or some other cavity, as nesting sites. Some species, such as the Robin, Phoebe, and Barn Swallow need only a ledge of some kind as a support for their nests, and hence these species are most readily accommodated about our buildings.

If we are to be successful in attracting the birds about our houses we must recognize that the great majority of species need cover into which they can retreat to escape their enemies, and also as shade and as shelter from winds and violent rain. Such cover is best provided by a thick growth of bushes and vines near the house, or by dense hedges. Where such cover does not already exist it must be planted, and where it does exist it is advisable to add to it certain species which are, by reason of the fruits they produce, particularly attractive to birds. Some of these species are doubly valuable as they not only attract the birds but they furnish early-ripening fruits which are preferred by the birds to cultivated fruits, such as cherries, and thus prevent depredations upon those fruits we wish to reserve for our own use. The species of small trees and shrubs which are thus of double value are the Shadbush (*Amelanchier canadensis*), the Red-berried Elder (*Sambucus racemosa*), the White Mulberry (*Morus alba*) an introduced species, the Bird Cherry (*Prunus pennsylvanica*), the Red Osier Dogwood (*Cornus stolonifera*) and the canes of the Red Raspberry (*Rubus idaeus*) and the Blackberry (*Rubus villosus*). There are a great many other species which furnish fruits later in the season and during the winter, which should be included in our thicket, but we shall treat of them when we discuss the matter of winter feeding.

Perhaps the greatest success in attracting birds is to be effected in the case of those species which normally nest in cavities in dead trees and in hollow limbs. Stubs and dead trees about the house do not appeal to our sense of beauty, nor are they safe, while the thrifty farmer removes all dead limbs from his orchard. Consequently such birds as the Chickadee, the Nuthatches, Bluebird, Tree Swallow, House Wren and the Woodpeckers, have to resort to the woods to find suit-

able nesting sites. They may, however, be induced very readily to breed in the vicinity of the house if nesting boxes are provided for their accommodation.

The more elaborate and ornamental a bird-box is the less likely it is to be tenanted. Such a simple box as shown in figure 1 is acceptable to many species, but the best kind of bird-box is that known as the Berlepsch box, shown in figure 2. This box is a short log, with the bark on, which has been split, hollowed out and an entrance drilled, fastened together, and an over-hanging cap nailed on it.

The dimensions in inches, of boxes for the different species should be as follows:

	Diameter of Chamber	Depth of Chamber	Size of Entrance
House Wren.....	4	6	$\frac{1}{2}$
Chickadee.....	4	8	$1\frac{1}{2}$
Nuthatch.....	5	8	$1\frac{1}{2}$
Tree Swallow.....	5	6	$1\frac{1}{2}$
Bluebird.....	5	8	$1\frac{1}{2}$
Flicker.....	7	16	$2\frac{1}{2}$
Screech Owl.....	8	15	3

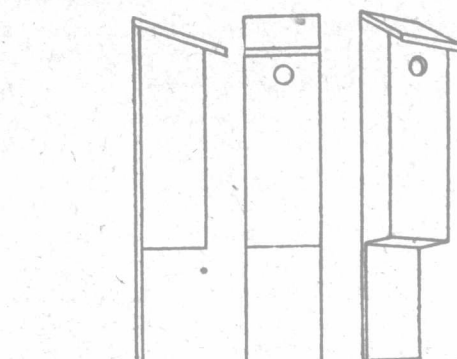


Fig. 1—A Simple Bird-box.
Drawing by P. A. Taverner.

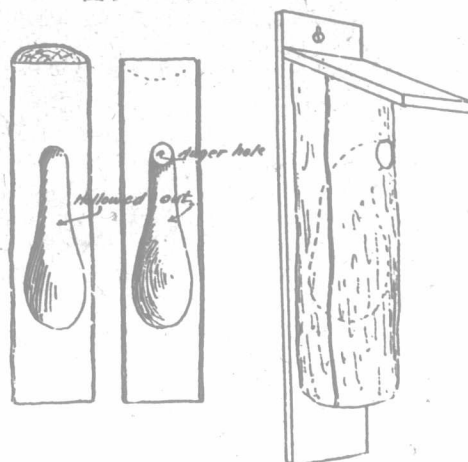


Fig. 2—A Berlepsch Bird-box.
Drawing by P. A. Taverner.

As some species do not carry in any nesting material but rely for this upon chips which fall on the bottom when they are excavating the cavity, it is best to place 2 tablespoonsful of sawdust in the bottom of the boxes with chambers 4 or 5 inches in diameter and five tablespoonfuls in the larger boxes.

Nest boxes may be hung at any time in the year, but the best time is in the autumn before the leaves fall, as then one can judge better as to the suitability of the location than in spring where the trees are bare, and the boxes are sure to be ready for the spring.

The boxes should not be hung in a very shady place, such as in the middle of a tree, for the dead stubs and hollow limbs which the birds would naturally use are never densely shaded, but are usually quite exposed. They should be hung on the trunk, on upright branches, or on the under side of sloping limbs.

The best heights at which to hang nest-boxes for the different species is: Bluebird, 5 to 10 feet, Chickadee, 6 to 15 feet; House Wren, 6 to 10 feet, Tree Swallow, 10 to 15 feet; Nuthatch, 10 to 15 feet; Downy and Hairy Woodpecker, 15 to 25 feet; Flicker, 10 to 20 feet; Screech Owl, 10 to 30 feet.

(To be continued.)

The Evolution of the Plow.

BY ALLAN MCDIARMID.

Probably none of the poets will object if I twist the words of one of them a little and say,

Spring is the time the farmer's fancy
Once more turns to thoughts of plows.

The time of year has come when the man who "feeds them all" has again to think of doing his share towards providing the world with the means of existence for another twelve months. And the first thing to be done, if he wasn't forehanded enough to have it all done last fall, is the plowing.

I heard a French-Canadian compatriot, who hadn't quite mastered all the intricacies of the English language, say, a couple of years ago, "We've got to keep plenty of men in Canada to tilt de soil." It struck me, that in using the word "tilt" in place of "till," he wasn't so very far out after all. The first operation the farmer per-

forms upon the land is to invert it, to tilt it up on edge with the plow. It is first in order and first in importance.

This being the case it might be worth our while to take a few minutes to find out something of the history of this machine, the plow, that we are all so familiar with that we hardly look on it as a machine at all, any more than we would look on a carving-knife as a machine. But it is one, just the same. The best of the world's mechanical genius went into its invention and perfection. The modern plow is a combination of instruments that have to be pretty nicely adjusted to one another to do the work we require of it at the present day. But familiarity with it has bred contempt and we fail to appreciate the skill that the mould-board alone is evidence of. Unless this part of the machine was perfectly formed and properly adjusted to the rest of the plow it could not raise the furrow-slice and turn it over in a way that would bring satisfactory results in harvest-time. A good plow is one of our best weed destroyers. A poor plow is a weed cultivator.

The first plows that we have any record of were nothing more nor less than a pointed stick which was pressed into the ground by the operator at the same time as it was being drawn forward by oxen or, as sometimes was the case, by four or five men. A later development came when the trunk of a small tree was used for tearing up the soil. Two small branches would form the handles. If a farmer of to-day could go to his wood-lot with his axe, select a suitable plow and bring it home on his shoulder, it would greatly help to reduce the high cost of farming. It would be a reminder of the days of our grandfathers who used to go to the bush for their pitch-forks.

The Romans were the first nation to bring the plow to anything like what it is at the present day. To the primitive form we have described they added the coulter and the mould-board. They even attached wheels to it to prevent it going too deep. From this time onward to the present day there has been gradual change and improvement. Those of us who attended any of the tractor demonstrations last fall and took note of the two, three and five bottom gangs that were at work turning over the ground, were inclined to the belief that the last word has been said in plow improvement. But it's hard to say. The ancient Egyptians may have thought that about his crooked stick.

But any of us that may be inclined to congratulate ourselves on the supposed fact that we are the first to use tractor-drawn plows or to make use of engines of any kind in the cultivation of the soil, had better make sure of the circumstances before we say too much.

Just three hundred years ago, or in 1618 to be exact, David Ramsey took out a patent for engines and machinery to plow the ground "without the aid of oxen or horses." But apparently this David Ramsey met the usual fate of inventors, for we have no record of his plow and engine coming into general use.

Then in 1769 another patent was taken out for a machine that was to plow, harrow and do every other operation on the land, without the aid of horses. The patentee this time was Francis Moore, and he was so sure his engine would be a success that he sold off all his horses and induced his neighbors to do the same, "because the price of that noble and useful animal will be so affected by the new invention that its value will not be one-fourth of what it is at present." But Moore was in the same class with some of our more modern prophets, who have foreseen the extinction of the horse. He and his friends all had to stock up again.

The next invention came in 1810. A Major Pratt took out the patent, and his plan was to have two engines, one at each head-land, drawing the plow back and forth between them, by means of an endless rope. There were two sets of plows that could be raised and lowered alternately so avoiding the necessity of turning them at the end. But for some reason or other the farmers of old England didn't take kindly to the Major's idea and the machine never came into general use.

But before the year 1832 several of these steam plows had been brought into practical operation. From the description of one of them it must have been somewhat similar to the "caterpillar" tractor of to-day. It is described as having a "broad, endless, flexible floor, or railway, attached to the wheels." It was intended for breaking up soft or swampy land. It worked on the same principle as the one last described, drawing the plows across the field between it and an auxiliary carriage on the other side of the field. But it cost too much to run it. It required no less than ten men and boys to operate it. And its daily work averaged eight and three-quarter acres. The inventor, a Mr. Heathcote, abandoned the machine after having spent \$60,000 on it.

From this time on improvements were gradually being made in both plows and engines and we quote these words from a report on the subject made in 1880. "There are at present about 800 or 900 steamplows in Great Britain and the demand for them is yearly increasing. The Leeds establishment is turning out about six engines, with their appurtenances per week; and other firms have also large demands. Many are exported to the continent, to the West Indies and to Egypt."

The ordinary reader of this report wonders where these machines and manufacturing plants have vanished to. There must have been a relapse to the old methods and manners, towards the end of the century, to judge by the lack of any accounts to the contrary.

But the progress outlined in those fifty or sixty years of invention and comparative failure were part of the evolution of the plow, and if we know it now in its perfection it is because of the contributions of the past. But the law of the Survival of the Fittest has never been replaced and who will undertake to say what kind of a plowing outfit will be turning up the soil in A. D. 2020.