

few instances do they eat any cultivated crop to such an extent as not to compensate for this waste by their habits of eating insects at some other period of the year.

Even in the case of the so-called seed-eaters which are ordinarily classed as injurious, the food of the young consists in great part of insects. Moreover, this latter class of birds destroys a vast quantity of the seeds of noxious weeds, thus further lessening whatever harm they may otherwise do; and so this habit is not an unmixed evil.

Although as a rule birds are encouraged about the farm, still, it is to be regretted that many birds are sacrificed which, with a better knowledge of their habits, the farmer would be led to protect and class among his benefactors.

As a result of the examination of the stomach contents of over forty different species of birds, the only one actually condemned on all hands is the English sparrow. Only the other day, I read an account in which the same sentence had been passed upon this bird in various parts of England, even a bounty being offered for its destruction. Owing to its pugnacious habits it often drives away our song birds and other useful native species.

Of the hawks only three species are condemned, namely, the sharp-shinned hawk, Cooper's hawk and the American Goshawk—while the rest are to be classed as highly beneficial to the farmer and horticulturist. The majority of the woodpeckers play a very useful part, except the redhead and sapsucker, which may be injurious or beneficial, according to circumstances.

In the case of the remaining birds, the testimony is greatly in their favor. The cedar, the crow, and the crow blackbird (1) are held to do far more good than harm. The kingbird, the phoebe, swallow, catbird house-wren, oriole, loggerhead shrike, vireos, cuckoo, rose-breasted grosbeak, shore lark, meadow lark and brown thrasher, all deserve to be especially protected by the agriculturist.

In short it may be laid down as a general rule that insectivorous birds are to be encouraged about the farm. Among the insect eating birds are the following: flycatchers, nuthatches, orioles, woodpeckers, warblers, wax wings, hummingbirds, grackles, goatsuckers, tanagers, vireos, titmice, kinglets, thrushes, swallows, wrens, thrashers, cuckoos, bluebirds, shrikes, and creepers.

BIRDS OF PREY.

Of the hawks and owls fully two-thirds may be considered as directly beneficial. As above stated, only three species were sentenced as injurious—the sharp-shinned hawk, Cooper's hawk, and the goshawk. Cooper's hawk is fortunately rather scarce in the neighbourhood of Montreal.

They are all three very destructive to small birds, an examination of the stomach of the sharp-shinned hawk revealing the fact that fully 95 per cent of its contents consists of the remains of birds. As the large majority of the birds of this class are highly beneficial, it is lamentable that the farmer so often sacrifices these most useful allies which may be said to labour incessantly for his benefit. As illustrating the destructiveness of the sharp-shinned hawk, Mr. E. D. Wittle, in his recent book *The Birds of Montreal*, says: "I shot two specimens August 28, 1886, on the mountain at Côte St. Antoine,

(1) The starling?—Ed.

and at the time observed them imitating the call of the American goldfinch, and chasing the latter birds in the trees evidently with the intention of devouring them." These being the only ones which are injurious, they ought to be carefully distinguished from the rest.

RED-TAILED HAWK, HEN HAWK.

The food-habits of this hawk lead it to feed principally on rats and mice, ground squirrels, rabbits, etc.

Dr. A. K. Fisher, speaking of this bird, observes: "While fully 66 per cent. of the red-tail's food consists of mammals, not more than 7 per cent. consists of poultry, and it is possible that a large proportion of the poultry and game captured by it and the other buzzard hawks is made up of old, diseased or otherwise disabled fowls, so preventing their interbreeding with the sound stock and hindering the spread of fatal epidemics." The disfavour with which it is commonly regarded is probably in great part due to its name.

RED-SHOULDERED HAWK.

It was found that ninety per cent of the food of this bird consists of injurious mammals and noxious insects. Our most common hawk.

MARSH HAWK, HEN-HARRIER

The food of this most valuable bird consists of meadow mice, squirrels and rabbits.

SWAINSON'S HAWK.

The habitat of this species is Western North America, and it is therefore only a casual visitant here.

These birds, which go in large flocks, are the great grasshopper destroyers of the West, and it is calculated that in one month 300 of these birds save some sixty tons of produce that the grasshopper would otherwise have destroyed.

SPARROW-HAWK

Not common here. During the warmer months, its food consists of various insects, and of mice during the remainder of the year. It is a summer resident.

AMERICAN LONG-EARED OWL.

This owl consumes mice mostly and attacks but few birds.

BARRED OWL.

This owl consumes mice mostly and is common. Much false opinion prevails regarding this bird, as only 4½ per cent. of its food is poultry. But even this small loss is preventable by shutting up the chickens at night. It also consumes injurious insects and small mammals—and among the latter some of our worst enemies.

SCREECH OWL.

This bird (which is also known as the Mottled Owl or Red Owl) is a winter visitant here, and is rather scarce. Injurious mammals and insects form nearly three-fourths of its food.

BARN OWL.

Dr. Fisher found that mice constituted 93 per cent. of the food of this owl. It also lives on rats, gophers, shrews, and other small mammals. The remains of no less than 1821 mammals, birds and batrachians were obtained from six hundred and seventy-five reglets or "pellets" taken from one of the towers of the Smithsonian Institution.

(To be continued).

AGRICULTURE IN COMMON SCHOOLS.

Natural science—Applied Science—Educate away from the farm—What to teach—Ignorance of common things—Fallacies about the Moon, &c.—Text-book.

"Eds. Country Gentleman."—Mr. Keach, p. 759, very pertinently opens the subject of agriculture in common schools, without taking any decisive ground for or against. Perhaps it is well to be conservative in new proposals of the magnitude of this, and to observe the trend of affairs, so that when one alights he will stand firmly on the right side of the fence. But a goodly number of educated, experienced and capable agriculturists have studied this question thoroughly, and are nearly unanimous in the opinion that "something ought to be done" to give the farming youth a better start in their own vocation than the common schools now furnish. Some would have more time devoted to the natural sciences, without naming the questionable word "agriculture," or showing any connection between the two. Science alone does a farmer little good, unless he is taught how to apply it. "Applied science" is what he needs; and in this case if this is not agriculture, then what is it? And if agriculture, then why not call it so?

Mr. Keach incidentally refers to the charge brought against the agricultural colleges that some of them educate away from the farm and not towards it. This is a point well taken, else so many graduates now in the service of public teaching would not be so chary of mentioning agriculture in the common schools. An agricultural college president, who has devoted much thought to the subject, in speaking of this feature recently, said: "It seems rather curious to me that any such should hesitate to come out strongly on this question, which, I am sure, they cannot but believe of primary importance in the development of our agricultural industry; yet in many cases I can see how they might object on the ground of expediency, and that 'they are not in entire touch with the farming community'—or in other words, they have been educated away from the farm."

On the other hand, these educators who are nearest the farm and the mass of farmers, so far as their public utterances on the topic are known to me, are in favor of adding the study of practical elementary scientific agriculture to the curriculum of the common schools in country districts, and calling the study by its right name.

If I understand this movement correctly, the originators do not desire to burden the curriculum with any full or complete course in agriculture, but only to give the pupils "a start in the direction"—to set them to thinking about their own vocation, to arouse a spirit of inquiry in them that will be lasting—so that they will continue their investigations through life. What little science they do acquire they should be taught how to apply, else it is of no economic use to them. Some of the natural sciences are taught in the schools now, but how many farms show any good results from this?

All reference to agriculture has been kept out of the schools from the time of the landing of the Pilgrims, and what class of farmers have we? Go anywhere, in any part of the country, and evidences can be seen in com-

dance that the common schools have failed to make good farmers of the large majority, who attend them. Is it not high time to adopt a better system of education, since the present system has proved a disastrous failure, so far as agriculture is concerned?

Many still plant, sow, kill hogs, and do some other things, "in the moon"; (1) and their cattle sometimes "lose their ends", which must be supplied with a piece of raw fat pork. Would it do any harm for the school-teacher to show the pupils the fallacy of these and other similar follies? Fully one-half of the diseases of animals are caused by improper feeding or care. Should not the scholars be taught correct feeding and care? If they do not learn these at the district school, nine-tenths of them never will know them; for their parents cannot teach them, nor are they able to send them away to an agricultural school.

Several in my own neighborhood will not cut timothy hay until the seeds will shell, "because it spends better," or lasts longer. They cannot be made to understand that it spends better because the stalks are more woody, and it takes stock longer to masticate it. I have told this to several, but they "know better." They declare there is no fertility in liquid evacuations of live-stock, because they "can't see it," and let all go to waste. Horse manure piled under cover, heating, and gases escaping for months, loses nothing, for no fertility can be seen escaping.

The facts are, they have all been to school, but the system of instruction was so lame they learned literally nothing about affairs which should most interest them. They are too old now to learn. Their habits and methods are fixed. They are in ruts, and there they will remain. The only hope of better farming rests with the young. Give them just a little start now in the right direction, impress upon their minds the evils of wrong ways and the benefits of correct methods, get them to thinking about it; the impressions will be lasting, and they will continue their investigations for life, and will supply themselves with the aid of books and papers bearing upon their every-day practices. Science alone leads from the farm; applied science keeps the boy upon the farm. But, he must be shown how to apply when young, or he will never know.

Mr. Keach says there is no suitable text-book. If he will look about a little, he will find one lately issued from the press for this special purpose, and admirably adapted to it, whose author is a farmer and a scientist. It is "simplified for use in primary schools." It is not "dry, prosy or pedantic," nor is it loaded down with unexplained scientific terms. Few such are used, any way. Any teacher, male or female, who is capable of teaching reading and arithmetic, can understand and teach it.

GALEN WILSON.

"Tompkins County, N. Y."

Household Matters,

FASHIONS IN DRESS.—It will rejoice the hearts of many people to know that the great, big sleeve is no longer fashionable. Still, they can be cut into the very modern style as there

(1) Alas! Many a farmer in this province still asks his wife what "the Almanac says the weathers will be to-morrow, and won't kill his hogs in the decrease of the moon lest," the meat should not take the salt."—Ed.