

INSECTIVOROUS BIRDS IN THEIR RELATION
TO MAN.

BY J. A. ALLEN.

DOUBTLESS many ornithologists who have attentively examined the contents of birds' stomachs have suspected that were the truth known it would be found that the insectivorous species are not to so great an extent the ally of man in his contest with voracious insect hordes as is generally believed. The community at large fails to recognize in this connection two important facts, namely: that there are beneficial insects as well as injurious ones, and that birds are indiscriminate in their captures. Were it an established fact that birds, in so far as they are insectivorous, are the friends of man, the notion that birds are useful in proportion to the number of insects they destroy could hardly have a firmer hold. On all sides the cry is raised "Protect the birds," while their actual rôle in relation to the insect world has scarcely received a serious thought. "Birds destroy insects, therefore they are an invaluable aid to man in his unequal struggle with these insidious foes," is a natural and general conclusion. That there are rapacious and parasitic insects, that these are the great natural check upon the undue increase of the plant-eating species, and that birds are useful only in proportion to the number of the latter they destroy as compared with the former, are facts that are generally ignored.

As above stated, it has not escaped the notice of those ornithologists who have a smattering of entomological knowledge that insectivorous birds may do much harm as well as great good, and that the popular and almost universal demand for their protection, while perhaps harmless, is at least based on ignorance of the real state of the case. I well recall being pained years ago by finding, with the cutworms and caterpillars, a conspicuous proportion of "lady bugs," rapacious ground beetles, and other predaceous insects in the stomachs of Thrushes, and of ichneumons with the soft aphides and caterpillars in those of Warblers. As an enthusiastic lover of birds, I feared the results to which a critical study of the food of insectivorous birds might lead; and

I have compared notes with other bird-lovers who share the same misgiving, based on their own casual study of the subject. But whatever the final outcome of such investigation, sentiment should of course give way to truth. Whether insectivorous birds, considered from the utilitarian side, are beneficial in their relation to agriculture, or positively (at least in many cases) injurious, or merely hold a neutral place, it is far too early yet to decide, for thorough investigation of the subject can be considered as having merely begun. The fact that they destroy large numbers of noxious insects is established beyond question; whether they do not at the same time devour so large a proportion of beneficial ones as to fully or more than offset the good they accomplish in the destruction of the former may be considered as an open question, which years of careful observation can alone decide. From investigations now in progress, notably in this country at the hands of Professor S. A. Forbes of Normal, Illinois, it is to be hoped that the data for an intelligent judgment in the matter will be soon reached. To Professor Forbes is due the credit of not only first directing attention to the subject, but of first instituting systematic research respecting the relation of birds to predaceous and parasitic insects. In addition to his own observations he has published a translation* of M. Édouard Perris's memoir on this subject, published in 1873 in the "Bulletin mensuel de la Société d'Acclimatation."† M. Perris, after many years of careful observation, expressed himself as "convinced that the current ideas respecting the utility of birds are prompted by impulse rather than reflection," and, he adds, "I believe that, if more attention had been paid to the rôle played by insectivorous birds and to the mode of life of the insects which injure us, very different conclusions would have been reached." After reviewing the subject at length, and presenting in detail his long array of facts, he formulates his deductions, calling attention to the fact that birds are scattered here and there in pairs "while insects invade *en masse* the trees which they attack, the products of the soil of which they are the enemies"; that while birds destroy enormous numbers of insects, these insects are in great part innoxious, while some are eminently useful. "The species really noxious are so few compared with the whole mass, that birds are really of little service. They

* American Entomologist, new series, Vol. I, 1880, pp. 69-72, 96-100.

† Republished here from the *Mém. de la Soc. roy. des Sciences de Liège*.

may even injure us, . . . especially by killing so many carnivorous or parasitic insects, which render us the greatest service." Reasons are also assigned why so many of the really noxious ones escape capture, either through their minuteness, their habits, or through special means of concealment or protection.

As Professor Forbes observes, the question of the food of birds is almost entirely a question for entomologists and botanists, although it has hitherto been left almost wholly to ornithologists, who have not usually the special knowledge requisite for its investigation even had they the desire to pursue this branch of inquiry. For this reason he hopes the attention of our economic entomologists will be turned in this direction, and has accordingly laid M. Perris's paper before them.

Professor Forbes has undertaken the investigation of the food of the Thrushes and of the Bluebird. His examination has thus far been preliminary or on too limited a scale to give conclusive results, yet yielding deductions that go far to show how greatly such studies are likely to revolutionize current opinion respecting the utility of birds as destroyers of noxious insects. His report on the food of the Thrush family (*Turdidæ*)* is based on the examination of the stomachs of fifty-one Robins, thirty-seven Catbirds, twenty-eight Brown Thrushes, eleven Wood Thrushes, eighteen Hermit Thrushes, eight "Alice's Thrushes," six "Swainson's Thrushes," and one Wilson's Thrush, shot in Illinois in various months from March to September. While the number of specimens is small, Professor Forbes claims that no equal number "has been previously studied with *equal care*," and gives his results "as hypotheses, more or less probable, but requiring verification by further study." A rigid examination of the food elements in these examples "determines the hitherto unexpected fact that the family is inordinately destructive to predaceous beetles (*Harpalinæ*), seven per cent. of the food of the 150 specimens consisting of these highly beneficial insects. When we remember that one predaceous insect must destroy many times its own bulk of other insects during its life, we see the importance of this fact in respect to the economical value of these birds. . . . Of the 150 Thrushes examined, forty-six per cent. had taken *Carabidæ*

* The Food of Birds. Trans. Illinois State Hort. Soc., Vol. XIII, 1879 (1880), pp. 120-172. — The Food-habits of Thrushes. Amer. Entomologist, new ser., Vol. I, pp. 12, 13, Jan., 1880.

[predaceous beetles], while of 194 birds of other families in whose stomachs insects were found, less than five *per cent.* had eaten these Coleoptera. The worst sinner in this respect was the Hermit Thrush. . . . Curiously, the ratio of *Carabidæ* continued undiminished during the fruit season, when the total of insect food fell away very rapidly. For example, the Cat-birds ate in May, June, and July eighty-seven *per cent.*; sixty-four *per cent.*, and eighteen *per cent.*, respectively, of insect food, while the *Carabidæ* for those months averaged seven *per cent.*, six *per cent.*, and ten *per cent.*, the corresponding fruit record standing nothing, thirty *per cent.*, and seventy-one *per cent.* . . . The absence of all, or nearly all, the specially protected genera is noticeable (unless the obscure color of many is reckoned a special protection)." * The full details of the observations made upon this family † show certain specific differences of food; that while the different species of this group agree in many particulars as regards food, that the differences are so marked that it is usually possible to "determine the species by the contents of three or four stomachs."

During April, the eleven Robins examined were found to have "apparently done very much more harm than good . . . eating predaceous beetles which would probably have destroyed many more noxious insects than were found in their own stomachs." In May the balance was found in favor of the four specimens examined; in June, in respect to five specimens, the balance was in the other direction, but probably turned favorably through the large amount of insect food procured for their young. The July record left "the scale trembling in the balance." The final conclusion respecting forty-one Robins is that they had, taken together, "certainly done, just previous to their demise, fully as much harm as good, as far as we can judge from the contents of their stomachs." With respect to the Catbird it was found that there was "an unexpected balance of about seven per cent. of injurious insects with which to pay for twenty-seven per cent. of fruit," for the three months of May, June, and July. With regard to the economic value of the Brown Thrush, Mr. Forbes thus sums the evidence: "so far as it can be supposed to be indicated by the stomachs of these twenty-eight individuals, I conclude that

* Amer. Ent., l. c. p. 13.

† Trans. Illinois State Hort. Soc., . c.

in April it gains a credit of about twenty-two per cent.; that in May, chiefly through the excess of predaceous beetles, this drops to about six per cent.; that in June it falls away to zero, and in July to minus thirty per cent., thus just about wiping out the credits of the previous months." The Hermit Thrush is counted a "public enemy" on the score of his excessive destruction of predaceous beetles. The Swainson's Thrush (under which name we include "the Alice Thrush") has a better record and is regarded as worthy of "what little encouragement and protection we can give it during its brief stay." On the whole the Thrush family, so far as our knowledge of their food extends, cannot be awarded "any great economical value."

Professor Forbes's showing for the "beautiful and beloved" Bluebird is certainly a surprise and a shock to our notions of its innocence and hitherto supposed high degree of usefulness. His detailed report,* based on an examination of eighty-six specimens, shows that the species preys largely upon predaceous beetles and ichneumons, the latter including special enemies of the cutworms and grasshoppers. In view of the many uncertainties that enter into the problem of the relation of carnivorous and parasitic insects to those which form their natural prey — whether or not their increase is sufficiently rapid to keep up their due proportion to these and also to furnish a surplus for destruction by birds — Professor Forbes believes that (as he rather obscurely puts it) while "the *probabilities* seem to be against the Bluebird," "the *certainties* are, as yet, in its favor." Taking into account, he adds in conclusion, "the certainty of the evil consequences of the destruction of the Bluebird, and the uncertainty of the possible good, I believe that, notwithstanding the apparent balance against the species, even the most radical economist, the most indifferent to the beauty and pleasure of the natural world, would have no present justification for throttling the song of the Bluebird in his garden with the hope of increasing thereby his annual store of hay and cabbage."

In respect to the general subject of the economic relation of insectivorous birds to insects, and to the results already attained through his detailed studies, Professor Forbes judiciously admits that the observations thus far made are far too few to settle the question, but that they indicate that the time has come for hesitation,

* Amer. Entomol., new ser., Vol. I, pp. 215-218, 231-234, Sept. and Oct., 1880.

for impartial study, and for a cautious balancing of the evidence; for those who are least prepared to understand their own ignorance to give attention to some of the conditions of the problem. What the final outcome will be it is quite too early to predict; what seems most probable is that while some insect-destroying birds may doubtless prove to be demonstrably beneficial to a greater or less extent, many others will prove to hold merely a neutral position, while a few may be found to be to a slight degree injurious. It is certainly time to abandon the ground that because certain birds subsist largely upon insects they are necessarily beneficial. It seems not improbable that the rôle of insectivorous birds, considering the class collectively, will prove to be in no way economically important, and that it will be safe to leave nature to adjust her own balance between birds and insects; that undue interference, either in the way of protection or of proscription, will tend rather to harm than to good. But birds are to be considered not merely with regard to dollars and cents—to the production of grain and fruits; they have their æsthetic relation, and, sentiment aside, we may long and wisely hesitate before outlawing even the few species that may seem to somewhat overbalance their services by indulgences which to some degree militate against man's material interests. So much do they contribute to our higher enjoyment, to such a degree is their presence a pleasure, and their influence ennobling, it would be an aspersion upon our civilization to even suppose that the time will soon come when public sentiment will demand for trifling cause the extirpation of creatures so thoroughly endowed with beauty, and with attributes that touch so deeply our inner life. While we may well look forward with deep interest to the results of thorough research in this direction, there seems little reason for anxiety, even on the part of those who would least welcome an unfavorable showing for their cherished favorites of the bird world.