

As a pioneer publication on economic ornithology for Brazil, this brochure is worthy of attention by those interested in the value of birds in their relation to agriculture. Chapters are devoted to the dangers attendant on extensive deforestation, the function of certain useful birds and animals, the breeding of wild forms in captivity, birds that are useful, animals friendly to agriculture, the usefulness of hummingbirds and bees, predacious insects, and the economic services of domesticated birds.

Grave dangers are foreseen in the extensive destruction of forests in many areas, not only to the native fauna but to climatic conditions in general. After a few notes on the value of certain mammals the author takes up the question of the birds useful to agriculture, sketching briefly the services of the various orders and families and giving an account of a few common species in each group. Attracting birds about fields and houses is recommended by the placing of pans of water and boxes containing grain and seeds.

The Black Vulture is said to do harm in carrying germs of various epizootics, on the authority of Dr. H. von Ihering. The other two vultures found (*Cathartes aura* and *C. urubitinga*) are apparently not included in this statement. They have been seen destroying snakes. More than sixty species of woodpeckers are found in Brazil. The author remarks that they constitute a "comissão sanitaria phitophathologica" for the forest trees. Attention is drawn to the destruction of injurious ants by *Colaptes campestris*. The Anis are said to destroy many cattle ticks (a belief not yet substantiated in stomach examinations in the Biological Survey). They feed on other insects and lizards as well. The Guira Cuckoo (known locally as *Almo de gato*) also lives on insects. The illustrations are in the main from photographs of mounted birds. The drawing (p. 35) labelled Ani is apparently some species of *Molothrus*.

In an appendix (pp. 106-118) is a short account of the wild pigeons of Brazil. It includes a discussion of their habits, nidification, food and range.

Though we may hesitate in endorsing fully some of the statements made in regard to the food of certain species, the author is to be commended for his efforts in behalf of the birds native to his country. Our knowledge of economic conditions in regard to Tropical American species is slight and it is hoped that the present contribution is the forerunner of more detailed investigations — A. W.

Third Report on Food of Birds in Scotland. — The report upon investigations of the food of birds in Scotland in 1913-1914, by Miss Laura Florence, has been published.¹ It catalogs the stomach contents of 891 birds, the total number now examined being 2897. As usual the report is made up of detailed analyses of individual stomachs, with brief summaries for each species. No general conclusions are drawn. Miss Florence is now at Stanford University preparing herself for a career in Economic

¹ Trans. Highland and Agr. Soc. Scotland. Fifth series, Vol. 27, 1915, pp. 1-53.

Entomology. It will be an occasion for congratulation to have an experienced bird student added to the ranks of entomologists.— W. L. M.

Economic Ornithology in Recent Entomological Publications.— Katydid's are said to have caused the loss of as much as a fourth of the crop in certain orange groves of California in 1914. The entomologists who describe the depredations — Messrs. J. R. Horton and C. E. Pemberton — state that "birds undoubtedly play an important part in reducing the number of adults each year."¹ "In 1911," they also say "a small chipping sparrow was noted in some abundance among trees of various Katydid-infested orchards, and was apparently very busily capturing Katydid's. Birds are undoubtedly the most important enemies of the Katydid in this section" (p. 11).

On the other side of the ledger must be set down the activities of bird enemies of *Calosoma sycophanta* a predacious beetle, introduced into New England on account of its value as a destroyer of the gipsy-moth. Messrs. A. F. Burgess and C. W. Collins in their report on this beetle say: "It is undoubtedly true that this species is eaten to some extent by birds, and the hairy woodpecker has been charged with destroying it on several occasions. The crow has been observed to feed on the beetles and also to carry them to their nests which were occupied by young birds."²

The authors, however, report a satisfactory increase and spread of the beetle.

The widespread outbreak of the army-worm, in 1914, called forth the publication of a number of bulletins, most of which acknowledge the value of birds as enemies of this pest. We quote from two of these reports. Dr. W. E. Britton, State Entomologist of Connecticut, states that "Of the birds occurring in Connecticut, the most important destroyers of the army-worm are the blackbirds, starlings, robins, thrushes, bobolinks, cat-birds, and barn swallows. Even the much despised English sparrow has been observed to feed upon them."³

With relation to an invasion of army-worms in Canada, Mr. Arthur Gibson says:⁴ "The wild birds are an important aid in outbreaks of noctuid caterpillars, and in 1914 large numbers of army-worms were devoured by them. Blackbirds were frequently noticed feeding upon the caterpillars in Ontario, and also in New Brunswick, as were also crows. During a local outbreak of the army-worm near Treesbank, Man., in 1913, Mr. Norman Criddle, Field Officer of the Branch, observed, in August, thousands of crows feeding upon the larvae. They were also seen to dig out and eat the pupae. A large flock of probably three thousand birds visited the infested locality every day from the time Mr. Criddle first noticed the worms until at least two weeks after the larvae had pupated. In western

¹ Bull. 256, U. S. Dept. Agr., July 27, 1915, p. 13.

² Bull. 251, U. S. Dept. Agr., July 27, 1915, p. 18.

³ Ann. Rep. Conn. Agr. Exp. Sta. for 1914, Part III, p. 166, 1915.

⁴ Bull. 9, Ent. Branch, Dept. Agr., Dominion of Canada, 1915, pp. 16-17.