on previous occasions at the possibility of publishing such extended county lists of birds in England compared with the difficulties attending such publications in America. Middlesex is with one exception the smallest county in England, some twenty by fourteen miles in extent, but it is noteworthy from the fact that it includes within its boundaries a large part of the City of London. One would suppose that such a thickly inhabited region would offer little of ornithological interest and that Harting's report on the birds of Middlesex published in 1866 would not admit much opportunity for additions, in view of the rapid spread of the metropolitan districts. This very extension has however brought with it the construction of sewage farms and reservoirs with a water area of over 1000 acres, which have offered increasingly attractive resorts for shore-birds and waterfowl respectively, and have added many records. Mr. Glegg's book is an historical résumé of the records for each species with an account of its present status, migration and breeding dates, etc., with an introduction covering general problems, a good detailed map and a bibliography of some 1300 titles. A model work of its kind and an indispensible reference volume for all interested in British ornithology. It is handsomely printed and illustrated with several aeroplane views of the country.—W. S.

Economic Ornithology in Recent Entomological Publications.—It is hoped that notes under this heading, so long continued (since 1911), justify themselves by their interest for ornithologists. Certainly the propagandist for bird protection can find much "grist for his mill" in the series, as for example such statements as that in the last entry of the present installment to the effect that birds are as important in certain cases as all other predators combined.

Green Stinkbug (*Acrosternum hilaris*).—This is an insect known to be injurious only locally but which restrictedly may be a very troublesome pest. The plants most injured in Virginia where the study[1] here reported on was made are lima beans and peaches. It is noted that "game chickens greedily devoured both nymphs and adults," and that Biological Survey records show 37 species of birds to feed upon stinkbugs of the same genus. Nine of these birds, common in Virginia, are specifically named.

Beet Leafhopper (*Eutettix tenellus*).—Some Utah entomologists took a favorable opportunity of learning about bird enemies of this well known pest. Birds were collected, their stomachs examined and remains of the leafhoppers found in those of 12 out of 20 species represented. The names of the birds are given together with the number of leafhoppers found. The authors state, "It appears that migrating, as well as native, insectivorous birds will readily feed upon the beet leafhopper when this insect is present in abundance."[2]

Japanese beetle (*Popillia japonica*).—This insect is a pest of great importance to early-ripening fruit, to corn, and to truck crops. While neither control measures nor natural enemies are preventing it from steadily extending its range, credit should be given notable predators, at least for efforts in a desirable direction. Comment on bird enemies of the Japanese beetle was given in 'The Auk' for July 1926 (pp. 396–397) and additional information of value may now be extracted from a publication[3] by C. H. Hadley and I. M. Hawley. These authors consider the Crow, Purple Grackle, Starling, Cardinal, Meadowlark, Catbird, Robin, and English Sparrow as

[1] Underhill, G. W., The Green Stinkbug, Bul. 294, Va. Polytech. Inst., Feb. 1934, 26 pp., 9 figs.

[2] Knowlton, G. F., J. S. Stanford, and C. F. Smith, Birds as Predators of the Beet Leafhopper, Journ. Ec. Ent., 27 (6), Dec. 1934, pp. 1196–1197.

[3] U. S. Dept. Agr., Circ. 332, Dec. 1934, pp. 19–20.

worthy of special mention. In one case Starlings are known to have reduced the population of grubs from an average of 100 to 5 or 6 per square foot.

Tortoise Beetle (*Metriona circumdata*).—This beetle is a pest of sweet potatoes and other food crops in China. The adult is warningly colored, and the larvae and pupae are both of peculiar form and spiny so that they are no doubt classed among protected insects. The author of a recent report[4] on the insect, however, found that all stages are eaten by birds and lists 8 species in the stomachs of which he found remains of the insect. The percentages of the stomach contents so constituted varied from 0.45 to 18.66.

Black-flies (*Simuliidae*).—These insects in addition to being annoying almost everywhere they occur, seriously afflict mankind in various regions by transmitting disease-producing nematode parasites. In connection with an account of such a situation in Guatemala Dr. Joseph C. Bequaert sums up[2] information on natural enemies of the flies, including birds. Most of the data traces back to Biological Survey records and the number of species of check-list birds involved is six. The Green-winged Teal, Blue-winged Teal and Water Ouzel are listed as feeding on the immature, and the Ruby-throated Hummingbird, Vaux's Swift, Philadelphia Vireo, and Ouzel, on the mature stages of blackflies.

Celery leaf tier (*Phlyctaenia rubigalis*).—Although it occurred in Florida celery fields for years before, this insect did not become seriously destructive until 1923. It caused great losses in 1925 and the stability of the industry was threatened. Temperature is the most important control factor, with egg parasites next. "In a normal season," according to authors[3] of a recent bulletin on the insect, "birds are the third most important factor in the control of the celery leaf tier, and for about 5 or 6 weeks in the spring they constitute the major control" (p. 41). The findings as to birds are based on field work and stomach analyses by F. M. Uhler of the Biological Survey in 1927 and 1928, but it may be of interest to state that study was carried on in later years by Dr. Dayton Stoner who has prepared a comprehensive manuscript report on bird enemies of the pest; it is hoped that this also will be published.

The birds reported in the Bulletin here cited as feeding most freely on the celery leaf tier include several migrants that usually do not win a place in lists of predators upon economically important insects. The Yellow Palm Warbler, for instance gets first mention, and after it the Tree Swallow, Pipits, Grackles, Red-winged Blackbird, Bobolink, and Cowbird. Summer residents that participated notably in the warfare on the tier were the Mockingbird and Meadowlark.

Birch leaf-mining sawfly (*Phyllotoma nemorata*).—This recently introduced sawfly ravaged birches in northern New England in 1927. At first little evidence of bird attack upon it was noted but year by year an increase was observed and measured by survey methods. A. E. Brewer of the Maine Forest Service reports[4] that by 1933 the destruction of prepupae had grown to nearly 50% and that of larvae to 20%. The prepupae are taken from wintering cells in the leaves both when they are on the trees and after they fall to the ground, Chickadees and Warblers being most prominent in the former activity, and Sparrows in the latter. Fifteen species of birds are mentioned as being positively known to feed on the insect. "The data secured strongly indicate that birds have been the most important predatory check upon the birch

[1] Yeung, K. C. Lingnan Science Journ., 13 (1), Jan. 1934. p. 159.

[2] Onchocerciasis, with special reference to the Central American form of the disease, Contr. Dept. Trop. Med. Harvard Univ., 6, 1934, pp. 190, 201.

[3] Ball, E. D., J. A. Reeves, B. L. Boyden, and W. E. Stone, U. S. Dept. Agr., Tech. Bul. 463, 55 pp., 26 figs., Feb. 1935.

[4] Journ. Ec. Ent., 27 (2), April 1934, pp. 342–344.

leaf-mining sawfly during the last three seasons and probably have been as important as all other predators combined." (P. 343).—W. L. M.

Mendall on Fish-eating Birds in Maine.—Howard L. Mendall reports[1] on two summers' field observations and on the examination of the contents of stomachs or regurgitated material illustrating the food habits of four species of birds. Their names and the percentage of individuals eating various types of food are given in the following table:

Name of Bird	Fish	Young Lobsters	Berries and other Vegetation	Echinoderms	Insects
Common Tern.....	45.8	1.9	1.9	1.3	10.9
Laughing Gull.....	37.5	5.0	——	15.0	30.0
Herring Gull.....	36.3	13.9	16.8	16.6	11.8
Double-crested Cormorant.....	80.0 (or more)	——	10.0	——	——

The food items listed are not all that were found but are those upon which estimates of economic value are based. The fish taken are said to have been chiefly herring and mackerel except in the case of the Cormorant which had eaten sculpin, cunner, flounder, eel, herring and tomcod. The first two species have no commercial use and are said to prey upon economically important fishes, while the last four are food fishes. The percentage of Cormorants taking fishes may be larger than 80 but the total is not given. The Cormorant is exonerated from serious blame and its protection is urged.

Although the Herring Gull ranks lowest in the tabulation as a consumer of fishes it is considered a menace to the fishing industry. It is regarded as materially destructive also to young lobsters and to blueberries. The Common Tern and Laughing Gull are excused for taking only a small share of commercial fishes amd appear to capture very few young lobsters. The Laughing Gull is given considerable credit as a consumer of insects and echinoderms although apparently being surpassed by the Herring Gull as a predator upon the latter animals which do some damage to shellfish. The destruction of blueberries by Herring Gulls is regarded as serious and feeding upon fish distributed as fertilizer also is charged against this bird. The species is considered a menace to other birds as a predator upon their eggs and young.

The accusations as to agricultural damage have been investigated from time to time by the Biological Survey, usually found less serious than reported, and considering the wary nature of the birds, apparently susceptible of some relief through the use of frightening devices.

In the reviewer's opinion the investigation reported upon would have been improved by use of the volumetric system of showing the consumption of food and by closer identification of food items particularly of insects than is shown in the published account. It is evident that the economic ratings announced for the three Laridae, at least, are a function of the relative numbers of the birds rather than of significant differences in their food habits. The Herring Gull is overabundant, from man's point of view, but if the other species attained equal numbers they would probably be considered injurious, at least to fisheries.

The increase in the numbers of Herring Gulls since the practical abolition of

[1] The relationship of certain sea birds to the fishing industry of the State of Maine, Bul. Dept. Sea and Shore Fisheries, apparently repaged 1–28, illus., 1935.