

overbalance almost unanimous testimony, based on many years of experience on the other side of the proposition. Mr. Brooks gives considerable space to general discussion of Economic Ornithology and the Protection of Useful Birds. Treatment of birds by systematic groups however makes up the bulk of the report.— W. L. M.

**Bird Pests in War Time.**<sup>1</sup>—Recent publications of the British Board of Agriculture and Fisheries show that war has brought home the necessity of controlling crop destroying pests, birds as well as mammals. Thus sparrows are coupled with rats and rooks with rabbits. The formation of rat and sparrow clubs is advised and the details of organization, and amounts of bounties they may pay are specified. For sparrows the rates, in each case for a dozen, are: one penny for eggs, two pence for young, and three pence for adults. Various methods of combating sparrows and rooks are advised, those involving the destruction of eggs and young being most favored. The sparrow is definitely classed as "small vermin" for which under certain restrictions poisons may be legally laid. To conserve lead the use of ammunition for destroying pests is permitted only under license.— W. L. M.

**Field Study of the Food of Nestlings.**—The 1915 volume of the Proceedings of the Indiana Academy of Science which has just come to hand (June 25, 1917) includes an article on 'The Food of Nestling Birds.'<sup>2</sup> This paper contains detailed records of the number of feedings of broods of the Brown Thrasher, Robin (10 nests), Wood Pewee (2 nests) and King-bird. The general nature of the food also is shown.

So far as this data goes, it is good, but it does not have the value implied by the authors in their somewhat inaccurate remarks upon another method of studying the food of nestlings. "It is contended," say they, "that the stomach contents afford the only accurate and reliable method of study of the food of birds. We believe that this method is not applicable to the food of nestling birds for two reasons: first, the food is soft and not readily identifiable; and the second and more important reason is that the food is digested very rapidly. The stomach contents do not serve as a criterion of the *quantity* of food that is eaten in the course of a day" (p. 232).

The remark in the last sentence is true; we must depend upon field observations to a large extent for ideas upon the quantity of food consumed. It must not be inferred however, that stomach examination is useless in this respect; on the contrary, it has served as the basis for a number of valuable estimates.

The declarations of Messrs. Enders and Scott, relating to the identification of the food of nestlings by stomach examination are wide of the mark

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<sup>1</sup> Leaflet No. 84, 1916, and Bulletins 2 and 4 of Series A, 1917.

<sup>2</sup> Enders, H. E., and Scott, Will, pp. 323-337.

and are the result of inexperience. The facts are: that nestlings do not thoroughly digest their food (apparently taking only the most available nourishment), so that identification is easier in corresponding cases than in adults; and that not only stomach analysis, but even examination of excrement, gives results that far surpass in definiteness and accuracy, anything that can usually be learned by field observation.

For instance contrast the following statements of the results (from the paper reviewed) of 16 hours watching the feeding of brown thrasher nestlings and the analysis of a few droppings of nestling cardinals.

<i>Brown Thrasher</i>	<i>Cardinal</i>
150 cutworms	17 rose-beetles ( <i>Macrodactylus subspinosus</i> )
9 "worms"	2 other Scarabæidæ
5 earthworms	1 click beetle ( <i>Limonius</i> sp.)
11 dragonflies	1 caterpillar hunter ( <i>Calosoma scrutator</i> )
10 beetles	1 leaf-hopper (Jassidæ)
50 ants	3 grasshoppers
1 grasshopper	1 spider
72 or more other insects.	1 dragonfly
	many bits of snail
	17 blackberry seeds ( <i>Rubus</i> sp.)
	221 mulberry seeds ( <i>Morus rubra</i> )

Is it not obvious that the examination of excrement if carried on to an equal extent would surpass field observations in every way? Stomach examination would be still more definite as to composition of food; but would not yield so much information on quantity. The greatest defect of this method however, is that only one batch of data is obtained from a single individual.

The foregoing notes on the cardinal are quoted from the reviewers' paper on the grosbeaks,<sup>1</sup> where the method of studying the food of nestlings by analysis of the excrement was urged. The method used was to tie a bag with a distinctly colored tape, over the breastbone and under wings of each nestling. The excrement can be gathered from such bags at any intervals desired and preserved as separate castings or in mass for analysis. The observer need not remain at the nest but can carry on similar operations at several nests if desired. This work could be carried on by the same class of observers who now publish data on the frequency of feeding and the material if analyzed by competent scientists, would yield a vast amount of definite and therefore valuable information.—W. L. M.

**Effect of Poisoning Operations on Birds; Value of Carrion Feeders.**—These interesting topics are further illuminated by data presented by W. W. and J. L. Froggatt in their third report on sheep-

<sup>1</sup> Bull. 32, U. S. Biol. Survey, 1908, pp. 23-24.