ADDITIONAL INFORMATION ON THE FOOD OF THE AMERICAN WOODCOCK

BY OLIN SEWALL PETTINGILL, JR.

IN May, 1933, I received from Mr. Robie W. Tufts, Chief Migratory Bird Officer of the Maritime Provinces, 207 adult American Woodcock (*Philohela minor*). These birds were seized for a violation of the Migratory Bird Treaty Act, having been retained in cold storage much longer than the time prescribed by law. All of these birds were taken in Nova Scotia in the counties of Halifax, Queens, Digby, and Annapolis, A few may have been taken in Yarmouth County. They were killed during October of the years 1927 to 1932 inclusive. The stomachs from 70 of these Woodcock were recently examined by Mr. C. C. Sperry of the Denver Laboratory of the U. S. Bureau of Biological Survey. The results of the examinations warrant a brief report for they contribute additional information to an account already published (Pettingill, 1936, 251-257) on 124 Woodcock stomachs examined at Cornell University.[1]

Vegetable Food

Small seeds were found in fifty-nine stomachs, amounting to 4.23 per cent of the total food. While one stomach contained as many as 84 seeds (74 *Rubus* sp., 4 *Carex* sp., 2 *Viola* sp. and 4 unidentified seeds), the seventy stomachs averaged only 9.52 seeds each. Other forms of vegetable material such as plant fibers, veins of leaves, and small rootlets were of so small a quantity as to be considered negligible in estimating the percentage of food content.

Table 1 shows the kinds of seeds found in the stomachs examined by the Biological Survey together with the number of stomachs in which they were found. To this table are added for comparative purposes the findings made at Cornell University.

A study of this table shows that the Biological Survey identified 20 genera of seeds not found at Cornell University and observed the repetition of only six genera. It is interesting to note that the seeds of *Rubus* and *Carex* occurred more often than other kinds of seeds in *both* the stomachs examined by the Biological Survey and those examined at Cornell University.

As I have previously stated (ibid., 253) these seeds were probably not ingested for food purposes. Rather were they taken in either as a form of grit used in digestion or taken in accidentally by sticking to the moist bodies of certain animals upon which the Woodcock had presumably fed. Since making this statement a third method of ingestion

[1] The stomachs examined at Cornell University were taken from birds collected in the vicinity of Ithaca, New York, and Cape May, New Jersey. All were obtained between 1930 and 1933.

has come to my attention, namely, the taking of seeds into the stomach that were contained in the digestive tracts of earthworms devoured.

TABLE 1

SEEDS FOUND IN WOODCOCK STOMACHS EXAMINED BY THE BIOLOGICAL SURVEY AND AT CORNELL UNIVERSITY

Name of Seed		Examinations by the Biological Survey (70 stomachs)	Examinations at Cornell University (124 stomachs)
		Number containing	Number containing
Panicum sp.	Panic Grass	6	1
Setaria sp.	Bristly Foxtail Grass	..	1
Setaria lutescens	Golden Foxtail Grass	..	7
Setaria viridis	Green Foxtail Grass	..	1
Phleum pratense	Timothy or Herd's Grass	..	1
Cyperus sp.	Galingale	6	..
Psilocarya sp.	Bald Rush	3	..
Scirpus sp.	Bulrush	3	..
Carex sp.	Sedge	38	17
Juncus sp.	Rush	3	..
Betula sp.	Birch	2	..
Alnus sp.	Alder	8	..
Rumex sp.	Sorrel	..	6
Rumex Acetosella	Sheep Sorrel	..	3
Polygonum sp.	Knotweed	2	15
Polygonum Convolvulus	Black Bindweed	..	1
Amaranthus sp.	Amaranth	..	1
Panunculus sp.	Buttercup	..	1
Brassica sp.	Mustard	..	16
Mitella sp. (?)	Miterwort	6	..
Fragaria sp.	Strawberry	4	..
Duchesnia sp.	Indian Strawberry	1	..
Potentilla sp.	Cinquefoil	20	..
Rubus sp.	Bramble	37	26
Melilotus sp.	Melilot or Sweet Clover	..	1
Ilex verticillata	Holly	1	..
Viola sp.	Violet	36	..
Hippuris sp.	Mare's-tail	1	..
Aralia sp.	Sarsaparilla & Spikenard	1	..
Vaccinium sp.	Blueberry & Cranberry	1	..
Cuscuta sp.	Dodder	3	..
Lippia sp.	Fog-fruit	1	..
Solanum sp.	Nightshade	4	..
Plantago sp.	Plantain	4	1
Galium sp.	Bedstraw	8	..
Lonicera sp.	Honeysuckle	1	..
Sambucus sp.	Elder	2	1
Compositae	Composite	1	..
Unidentified seeds		6	..

ANIMAL FOOD

Animal matter was found present in all 70 stomachs and composed 95.77 per cent of the total food.

Evidences of earthworms were found in all but one stomach, making up 85.78 per cent of the total food. Fourteen stomachs contained no

other food. These 70 stomachs emphasize even more than the stomachs examined at Cornell University the pronounced selectivity of Woodcock diet and the importance of its specialized probing habits.

The remaining 9.99 per cent of animal food consisted of the following groups:

Name	Per cent food
Isopods	.07
Millipedes	.14
Centipedes	.03
Spiders	.74
Insects—	
Beetles	3.63
Caddis-flies	.09
Caterpillars	1.14
Fly larvae	4.03
Hymenopterons	.11

One Woodcock stomach possessed several vertebrae of a minute salamander. This is the first known instance of a Woodcock having fed upon a chordate animal.

Table 2 summarizes the data on animal food in the seventy stomachs examined. Included here also are the tabulations on animal food in the 124 Woodcock stomachs examined at Cornell University.

TABLE 2

SUMMARIZED DATA ON ANIMAL FOOD IN WOODCOCK STOMACHS EXAMINED BY THE BIOLOGICAL SURVEY AND AT CORNELL UNIVERSITY

	Examinations by the Biological Survey (70 stomachs)		Examinations at Cornell University (124 stomachs)	
Name of Food	Number Containing	Per Cent Containing	Number Containing	Per Cent Containing
OLIGOCHAETA (Earthworms)	69	98.57	52	48.57
CRUSTACEA				
Isopoda (Isopods)	1	1.42	..	....
DIPLOPODA (Millipedes)				
Julidae	1	1.42	..	....
Polydesmidae	1	1.42	..	....
Unidentified Millipedes	..	....	1	0.80
CHILOPODA (Centipedes)				
Geophilidae	2	2.85	..	....
Unidentified Centipedes	..	....	11	8.87
ARACHNIDA (Spiders)	28	40.00	..	....
HEXAPODA (Insects)				
Hemiptera				
Lygaeidae (Chinch-Bugs)	1	1.42	..	....
Coleoptera				
Carabidae (Ground-Beetles) Consisting of both adults and larvae	28	40.00	8	6.45

(Continued on next page)

TABLE 2 (cont'd)

Name of Food	Biol. Surv. (70 stomachs) Number Containing	Biol. Surv. (70 stomachs) Per Cent Containing	Cornell (124 stomachs) Number Containing	Cornell (124 stomachs) Per Cent Containing
Staphylinidae (Rove-Beetles) Consisting of both adults and larvae	11	15.70	2	1.61
Scarabaeidae (Lamellicorn Beetles)	3	4.28	..	....
Rhynchophora (Snout-Beetles)	2	2.85	..	....
Unidentified Weevils	1	1.42	..	....
Dytiscidae (Predacious Diving-Beetles)	..	....	1	0.80
Tenebrionidae (Darkling-Beetles)	6	8.57	..	....
Heteroceridae (Variegated Mud-Loving Beetles)	1	1.42	..	....
Elateridae (Click-Beetles) Consisting of larvae only	2	2.85	15	11.91
Telephoridae (Telephorid Beetles)	4	5.71	..	....
Hydrophilidae (Water-Scavenger Beetles)	..	....	2	1.61
Unidentified Beetles	2	2.85	..	....
Trichoptera				
Unidentified larvae	1	1.42	..	....
Caddis-fly cases	1	1.42	..	....
Lepidoptera				
Unidentified caterpillars	7	10.00	2	1.61
Pupa cases	3	4.28	..	....
Diptera consisting of larvae only				
Tipulidae (Crane-Flies)	25	35.70	17	13.70
Chironomidae (Midges)	1	1.42	2	1.61
Culicoides sp.	..	....	1	0.80
Tabanidae (Horse-Flies)	1	1.42	..	....
Tabanus sp.	..	....	1	0.80
Chrysops sp.	..	....	3	2.41
Sarcophagidae (Sarcophagids)	1	1.42	..	....
Leptidae (Snipe-Flies)	11	15.7	3	2.41
Bibionidae (March-Flies)	..	....	2	1.61
Bibio sp.	..	....	1	0.80
Stratiomyidae (Soldier-Flies)				
Stratiomyia sp.	..	....	1	0.80
Therevidae (Stiletto-Flies)	..	....	1	0.80
Syrphidae (Syrphus-Flies)	..	....	1	0.80
Acalyptratae (Acalyptrate Flies)	..	....	12	9.67
Muscoidea (Muscoid Flies)	..	....	6	4.83
Unidentified fly larvae	4	5.71	..	....
Hymenoptera				
Formicidae (Ants) including several *Myrmica* sp. and *Formica* sp.	7	10.00	..	....
Chalastrogastra (Saw-Flies)	1	1.42	..	....
Andrenidae (Andrenids)				
Anthophora sp.	1	1.42	..	....
Unidentified hymenopterons	2	2.85	..	....
AMPHIBIA				
Salamander	1	1.42	..	....

A study of Table 2 shows that sometimes the Woodcock feeds on insects that are strictly aquatic. The presence of caddis-fly larvae and cases, predacious diving-beetles, and water-scavenger beetles bears substantial evidence of this fact. To obtain these insects the Woodcock must of necessity feed in water, probably by wading in shallow places. Shelley (1933: 95) has presented field observations that further support this belief. At East Westmoreland, New Hampshire, he watched a Woodcock following along drying stream beds and collecting aquatic life from it. Table 2 also shows that the Woodcock feeds, at least occasionally, on such fast-moving animals as spiders, centipedes, and adult carabid beetles. Thus the Woodcock, while decidedly specialized in its feeding habits, does exhibit at times the traits of its more generalized shore bird relatives.

LITERATURE CITED

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