These are: March 20, 1933, two came to the mountain-ash trees in the yard, but found only skins of berries. Some Eastern Purple Finches (*Carpodacus purpureus*) had taken most of the 1932 crop and also what I had saved for use in trapping for banding operations. The last record is November 24, 1936, two at the mountain-ash trees, but again too late, as a flock of Cedar Waxwings which remained late, and some European Starlings (*Sturnus vulgaris*) had cleaned up the 1936 crop, and they refused even to go to the traps nearby for a taste of the berries.—Oscar McKinley Bryens, *R. F. D. No. 1, McMillan, Luce County, Michigan.*

North-south versus northeast-southwest migration of the Starling.—Kalmbach (Wilson Bull., **44:** 67, 1932) has published a map of returns from Starlings (*Sturnus vulgaris*) banded at Washington, D. C., in the winters of 1927–28 and 1928–29, showing a northward migration of banded winter birds from Washington, some actually to the eastern end of Lake Erie and the St. Lawrence. Such data are at variance with the hypothesis of two more or less separate northeast-southwest migration axes, one near the Atlantic coast and a second in the Great Lakes Basin. They presumably do not invalidate that hypothesis, however, but show another factor, probably of considerable importance, in the complicated migrational and distributional movements of the bird. Though with an inherited northeast-southwest direction which has accounted for much of its distribution, the Starling presumably moves directly south into new territory under pressure of winter, some birds at least returning north to the same breeding area the following spring, whereas the extension of its range directly north into new territory is a slow matter. Even so, with Washington in the bird's primary Connecticut-New Jersey, northeast-southwest axis of distribution (Auk, **54:** 210, 1937), the paucity of returns to the northeast on this map requires explanation. The high and steadily increasing concentration of wintering Starlings in New Jersey very likely absorbs migrants from the northeast along this axis, so that those found wintering in Washington were for the most part local or derived from other sources.

The appearance in the 'Bird-Lore' Christmas census in 1926 of wintering Starlings near the lower part of the Penobscot Valley in Maine, and their regular occurrence in the State in succeeding censuses, may be taken as evidence of another case where the bird was driven south into new territory by winter. In a trip through northern New England by road in the summer of 1936, I found the Starling near Houlton, Maine, and in adjacent New Brunswick, and more plentiful in Quebec north of the Vermont line, but missed it in the coastal region from the Massachusetts line to Bangor. It seems more probable that such Maine-New Brunswick birds reached these summer quarters following the Great Lakes axis north of Vermont and New Hampshire, than that they crossed the wide stretch of coastal Maine where they must still be uncommon to have been missed, in an extension of the New Jersey-Massachusetts axis. Such being the case they might reasonably be supposed to have reached coastal Maine as winter visitants from the north down the Penobscot Valley.—John T. Nichols, *New York, N. Y.*

A Pine Warbler killed by arsenical spray.—On June 22, 1937, Earl Whitcomb picked up, under a large pine tree, at Beverly Farms, Massachusetts, a Northern Pine Warbler (*Dendroica pinus pinus*) in fine adult plumage. On careful examination the bird showed no evidence whatever of external damage.

As I have long suspected that there was a mortality among insectivorous birds owing to the practice of spraying vegetation with arsenate of lead, and as I surmised that eating insects which had been sprayed or which had fed on sprayed foliage

might possibly be the cause of this bird's death, I brought the bird to Cambridge and enlisted the interests of my colleague, Dr. Jeffries Wyman, Jr., who, in turn, persuaded Dr. A. J. Haagen-Smit and Dr. George Hass to make a careful chemical analysis, first, of the liver and kidneys of the bird and, secondly, of the other remaining tissues. General diffusion of arsenic throughout the whole body would possibly have been inconclusive as representing either high tolerance or chronic poisoning; but the finding of most of the arsenic in the liver and kidneys is good evidence that we have here the cause of its death.

Doctors Haagen-Smit and Hass's report follows, published here by their kind permission:—

"An examination of the viscera of the bird revealed nothing of importance. They were intact. The liver and kidneys were carefully dissected away from the neighboring structures and were removed without contamination by intestinal contents. The total amount of hepatic and renal tissue weighed approximately 500 mgm. The bird was then divided into two parts for determination of the content of arsenic.

"The liver and kidneys were placed in a 50 cc. distilling flask; 25 cc. of concentrated hydrochloric acid (Merck) with less than 0.00001% of arsenic were added. The digestion was almost complete in 24 hours. The distilling flask was then connected to a condenser. The receiving flask contained a few cc. of distilled water. The distillation was continued almost to dryness. Then a second quantity of 25 cc. of concentrated hydrochloric acid was added to the residue. Three hours later this fluid was distilled off into a receiving flask. The two fractions of distillate were united.

"The procedure for digestion of the remainder of the bird was the same. About 125 cc. of hydrochloric acid were required to carry the digestion to completeness, only a small amount of residue remaining in the flask.

"The arsenic content was determined by the Marsh-Gerzeline method, as described in 'Legal Medicine and Toxicology' (Peterson, Haines & Webster, vol. 2, 1923).

"The liver and kidneys contained 0.51 mgm. of arsenic. The remainder of the bird contained 0.003 mgm. of arsenic."

(*Signed*) A. J. Haagen-Smit
George Hass

It is greatly to be hoped that similar analyses may be made from time to time, and Dr. Hass has indicated his willingness to repeat the examinations should opportunity offer. Birds sent to the undersigned will be welcome if accompanied by definite information concerning the circumstances under which the dead specimens were found.—Thomas Barbour, *Museum of Comparative Zoology, Cambridge, Mass.*

Palm Warbler in Bermuda.—On March 15, 1937, I found a Palm Warbler, typical *Dendroica palmarum*, on the golf-club grounds at St. George's. It was very tame, allowed a close approach, and was under excellent observation with a Zeiss binocular for several minutes. The subspecies was positively determined by the entire absence of yellow on the under parts except for the vent and under tail coverts, which were in sharp contrast with the dirty brownish white of throat, breast and belly. Oddly enough this race is unrecorded from Bermuda, a curious lacuna, which the late Warren F. Eaton predicted would be filled at almost any moment (cf. Bradlee, Mowbray and Eaton, 'List of Birds recorded from the Bermudas,' Proc. Boston Soc. Nat. Hist., vol. 39, p. 364, 1931). As is now well known, the 'Western' Palm Warbler in winter plumage is easily distinguishable in life from the Yellow