

NOTES ON DETERMINATION OF SEX AND AGE IN
THE WOODCOCK AND MOURNING DOVE

BY GEORGE A. PETRIDES

It is now well established that sex and age ratios are important in the study of population characteristics and fluctuations in animals. Attempts to establish sex criteria in the Woodcock, *Philohela minor*, and Mourning Dove, *Zenaidura macroura*, have been only partially successful, while age determination techniques are practically lacking.

The present study was largely incidental to similar investigations on other species made while the author was connected with the Ohio Co-operative Wildlife Research Unit, Ohio State University, Columbus, Ohio.

WOODCOCK

Thirty skins were seen at the United States Fish and Wildlife Service collections in Washington and seven were borrowed from the Maine Cooperative Wildlife Unit. Though these were studied and compared, no external sex differences were found other than those described by Mendall and Aldous (1943). Similarly, no constant age differences could be found either in the plumages, X-ray films or skeletons of two juveniles and two fresh adult specimens collected in north-west Pennsylvania during November, 1947. The "jaw" test as applied to some gallinaceous species (Petrides, 1942; Linduska, 1945) was found to be of no value with these birds. Two juvenile females and one adult of each sex comprised the four specimens whose ages were determined by the presence or absence of the bursa of Fabricius.

The only age criterion found to be of value was the bursa of Fabricius, and this organ was more difficult to work with in the Woodcock than in the gallinaceous game birds. The bursae were clearly evident upon dissection in two birds, both females; they were absent in the other two specimens. The bursae seen were 14 and 16 millimeters long, respectively. They were imbedded in fat but were easily separated from it.

It was determined that, unlike the waterfowl, the Ring-necked Pheasant, *Phasianus colchicus*, and Ruffed Grouse, *Bonasa umbellus*, the bursa of the Woodcock has no opening into the cloaca. The bursa in young of the year was found to be large, with a central lumen that was macroscopically evident upon cross-sectioning. No canal through the dorsal wall of the cloaca could be located, even with a fine probe. Determining age by probing for the bursa through the vent as is so

commonly done in the Pheasant, therefore, apparently is impossible in the Woodcock.

MOURNING DOVE

The present investigation was on 65 birds made available by Dr. Lloyd G. Webb, formerly Research Fellow at the Ohio Cooperative Wildlife Research Unit. They were collected by him between May 23, 1947, and April 20, 1948, and included 41 males and 24 females. All had been labelled and frozen until early June, 1948, when they were examined. Sex differences in the plumage and sex and age differences in the cloacal region were studied.

While adult Mourning Doves of both sexes are very similar in appearance, some plumage differences seem to be recognizable. Pearson and Moore (1941) sexed 3491 doves in Alabama by both internal and external examination and state that "it was found impossible to accurately sex doves by external characters such as size and plumage." The present author studied a much smaller series of birds but found constant external differences between the sexes in these birds.

The most obvious points of distinction in the plumages of doves were in the color of the breast and crown of the head. As is commonly true among birds, the male dove has the more colorful plumage. The breast of the male is tinged with a faint but beautiful pink color which is absent from the plain brown breast of the female. The crown of the head in males, too, is a pronounced bluish-gray. In females, the top of the head is brown, like the sides of the head. These sex differences are noted in a number of standard ornithological works (see Chapman, 1934).

No errors were made in checking 51 birds in adult plumage when sex was determined first by plumage color and then by dissection. With a small collection of accurately sexed study skins at hand, there would seem to be no reason why live-trapped birds, at least, could not be rather accurately sexed by plumage characteristics.

Sexing juvenile birds by the incoming post-juvenile plumage was found to be more difficult. The plain, brown, contour feathers of the breasts of females contrasted so strongly with the more dull, juvenile plumage that several female specimens were misidentified as males. None of the birds of this juvenile series was dissected, however, until after judgment of the sex of all was attempted by plumage characteristics. Accurately sexed study skins of specimens in advanced stages of the post-juvenile molt would have been helpful for comparison.

No investigation of age criteria in the plumage was attempted in this study, but see Pearson and Moore (1940).

With Hochbaum's (1942) methods of determining sex and age in waterfowl in mind, cloacal examination of dead Mourning Doves was attempted. It was thought that, while the penis would not be evident in males, the presence or absence of openings of the oviduct and bursa of Fabricius might indicate sex and age, respectively. Though use of an otoscope (the lens-equipped, flashlight-like device used by physicians to examine the interior of human ears) was attempted, direct examination proved much more helpful. The sphincter muscles encircling the vent were relaxed by stretching, whereupon the interior of the cloaca in these dead birds was easily visible.

It was found that the oviducal opening was easily located in adult females but could not be discerned in younger birds. Presumably, sexual maturity or even the passage of eggs is required to enlarge the opening to readily visible proportions. In 11 females in which the bursa was absent, the oviducal opening was evident, ranging from two to seven millimeters in diameter when relaxed. In one of these 11, the opening was overlooked on the first examination. In a twelfth female, presumably an adult, no oviducal opening could be found even after a thorough search. The opening seemed to be occluded by a thin membrane. The ovary and oviduct of this specimen, taken on July 16, were maturely developed otherwise. In five juveniles, no such opening could be found. Winter females were scarce in the collection; none was collected between early September and February 28. The only one suitable for study was taken on the latter date at which time it lacked both a bursa and an oviducal opening. It is not known whether oviducal openings become reduced in size in adult females during the non-breeding season. If further evidence indicates that the opening of the oviduct is not visible in some females, then, of course, it is evident that this structure can serve in only a limited way in sex determination. At least during the breeding season, however, sex studies of live, nesting doves possibly may be aided by cloacal examination following the application of a 10% cocaine solution (Hochbaum, 1942) or other anesthetic to the vent.

Study of the bursa in the Mourning Dove revealed that, like the Woodcock but unlike the waterfowl and at least some gallinaceous game birds, there is in the dorsal wall of the cloaca no opening leading into the lumen of the bursa. The only apparent method of determining the presence of the bursa was dissection. Often, too, the bursa was found to be imbedded so deeply in fat that a careful search for it had to be made along the dorsal wall of the cloaca and within the body cavity.

The several bursae seen measured up to eight millimeters long by

seven millimeters in diameter at the base. The latest occurrence of a bursa in the birds studied was in a male collected on December 10 when it apparently had a complete first-winter plumage. This bursa measured seven millimeters long by five millimeters wide at the base. In the only January specimen which had remained well-preserved, the bursa was absent.

Where doves must be rapidly checked for age in the field, the size and development of the sex organs alone may serve as a convenient source of sex and age information without resorting to dissection of the bursa. The enlarged testes and ovaries of adults were in invariable contrast to the undeveloped sex organs of juveniles in the Ohio birds examined. Whether this method is useful in southern areas is not known.

LITERATURE CITED

- CHAPMAN, FRANK M. 1934. *Birds of eastern North America*. (D. Appleton—Century Co., New York), 581 pp., illus.
- HOCHBAUM, ALBERT. 1942. Sex and age determination of waterfowl by cloacal examination. *Trans. Seventh N. A. Wildl. Conf.*, 1942: 299-307.
- LINDUSKA, JOSEPH P. 1945. Age determination in the ring-necked pheasant. *Journ. Wildl. Manag.*, 9: 152-154.
- MENDALL, HOWARD L. AND CLARENCE M. ALDOUS. 1943. The ecology and management of the American woodcock. *Maine Coop. Wildl. Res. Unit*, 201 pp., illus.
- PEARSON, ALLEN M. AND GEORGE C. MOORE. 1940. Feathers may reveal age of mourning doves. *Alabama Cons.*, November, 1940: 9.
- PEARSON, ALLEN M. AND GEORGE C. MOORE. 1941. Dove sex ratio found almost evenly divided. *Alabama Cons.*, May, 1941: 8.
- PETRIDES, GEORGE A. 1942. Age determination in American gallinaceous game birds. *Trans. Seventh N. A. Wildl. Conf.*, 1942: 308-328.

Texas Cooperative Wildlife Unit, Texas A. and M. College, College Station, Texas, June 20, 1949.