be determined from feathers, pellets, and other fragments, no Prairie Chickens were brought into the young during the observation period.

Although the wire enclosure method of observing the hawk family was not as successful as we anticipated, the information realized seemed to indicate that Marsh Hawks are not an important factor in the survival of upland game birds on this area.—W. HENRY LEIGH, *Wright Junior College, Chicago, Illinois.*

Remnant Numbers of Prairie Chicken in Southeastern Minnesota.—The dependence of Prairie Chicken (*Tympanuchus cupido americanus*) on large undisturbed breeding grounds for their continued existence is remarkably illustrated in the vicinity of Spring Valley in southeastern Minnesota. The area immediately west and south of this village is part of the original prairie and in early days was the natural habitat of the Sharp-tailed Grouse (*Pedioecetes phasianellus campestris*). With the settlement by the white men, and the resultant increase in grain fields, the Sharp-tailed Grouse receded to the west and north and the Prairie Chicken came in from the southern range. The large areas of open wet grassland, interspersed with corn and grain on the upland, apparently provided an excellent habitat for Prairie Chicken and they increased greatly until shortly after 1900. The early 20th century sportsman enjoyed an all year season and a "wagon-box limit" on the species. Hunters often shot from blinds on the booming grounds during the spring season. The birds were easy targets as they flew in from the surrounding area. Local farmers report that since about 1910 the birds have gradually decreased in numbers as the result of more intensive cultivation, drainage, and hunting. The resident birds are at present confined to a few areas which have escaped drainage and cultivation and remain in a semi-prairie type. In the office of the Soil Conservation Service at Spring Valley, Minnesota, is an aerial photograph of the headwaters of Deer and Bear Creeks. An observer, even though not familiar with this vicinity, could readily point out on the basis of cultivation the areas on which the Prairie Chicken has been reported during the last three years.

The area southeast and southwest of Spring Valley, is unlike most of southeastern Minnesota and probably contains the only permanent resident flocks of Prairie Chickens in this section of the State. During the spring of 1936, the writer and Peder N. Lund located two booming grounds in Section 12, Township 101 N, Range 13 W. Several visits were made to these grounds and 12 to 16 birds were present on each field and were conspicuous by their general inactivity. Dancing and booming were interrupted with long periods of silence. Birds were heard occasionally in the immediate vicinity but no other booming grounds were located. One bird was observed to alight and boom near the junction of two roads a mile south, indicating the occasional promiscuous booming which was often heard at random locations nearby.

The booming grounds above mentioned were plowed in the fall of 1936 and in the spring of 1937 the Prairie Chickens abandoned the area, moving to a point one mile south in Section 13, Township 101 N, Range 13 W. They occupied a grassy knoll 100 yards north of a marshy pond. On May 7, 1937 (when *Caltha palustris* and *Populus tremuloides* were in flower) 12 birds were seen in an excellent display from 5:00 A.M. to 6:15 A.M. when a light rain seemed to stop further activity. Several visits to this vicinity in the spring of 1937, 1938 and 1939 to locate other booming grounds proved fruitless and it is rather doubtful whether other grounds were being used. On October 15 and 16, 7 and 17 birds respectively, were observed from a cornfield one quarter mile east of the booming ground in Section 13. Farmers report the presence of Prairie Chickens throughout the winter, at which time their cruising radius is extended to cornfields several miles distant from the meadows where they return each night. The last visit to these grounds was made on April 30, 1939 from 5:00 A.M. to 6:30 A.M. Eight or

ten birds were observed but were generally inactive. The morning was calm, clear and warm and early enough in the season for a more active booming display.

Reports have been received of a resident flock of Prairie Chickens 4 miles north and 1 mile west of LeRoy, Minnesota. These birds were reported booming in this area in the spring of 1939. Another resident flock has been reported in an undrained area 2 miles south and 1 mile east of Grand Meadow, Minnesota. Although several visits were made to the areas by the writer, the reports have not been verified by actual observations.

Analysis of available information indicate that the Prairie Chicken in southeastern Minnesota is slowly declining in numbers and that their existence is largely dependent on the maintenance of large undisturbed breeding grounds in the undrained prairie lands. It is doubtful whether the Prairie Chicken have even maintained their populations during the past three years. A shift in farming from cultivated crops to grass crops may retard this decline.

General observations on these Prairie Chicken while booming, flushing or cruising indicate the birds are unusually timid, probably the result of direct disturbance or the harmful changes in their environment by man. The flushing distance was usually more than 100 yards and the flight limit beyond the human vision.—URBAN C. NELSON, *Soil Conservation Service, Chillicothe, Missouri.*

Food of the Short-eared Owl During Migration Through Pennsylvania.—Since July 1, 1938, the food habits of all raptors on the 1,675-acre Ring-necked Pheasant (*Phasianus colchicus torquatus*) study area in Lower Macungie Township, Lehigh County, Pennsylvania, have been investigated by the Pennsylvania Cooperative Wildlife Research Unit for the purpose of determining the effects of birds of prey upon the pheasant population. The Short-eared Owl (*Asio flammeus flammeus*) rarely breeds in Pennsylvania, but it is often observed during migrations. At least four times during the course of the pheasant investigation, groups of migrating Short-eared Owls hunted and rested on the study area for several days at a time.

The owls usually roosted in weedy grain stubble fields during both spring and fall migrations. Seventy-two pellets, from at least 14 different owls, were collected from roosting sites on the study area. Eighteen pellets were collected in November 1938; 42, in March and April 1939; and 12, in September 1939.

The analysis of the bony contents of the pellets yielded the following items of prey: meadow mice (*Microtus pennsylvanicus*), 98; deer mice (*Peromyscus* sp.), 26; house mice (*Mus musculus*), 3; short-tailed shrew (*Blarina brevicauda*), 2; Flicker (*Colaptes auratus*), 1; unidentified small birds, 3; and frogs (*Rana* sp.), 4.

Although the data were meager, there was no significant variation between spring and fall food habits. During both migrations mice appeared to be the staple food, while other items of prey were merely incidental.—PIERCE E. RANDALL, *Department of Zoology and Entomology, The Pennsylvania State College.*

Unusual Behavior in the Chimney Swift.—Birds, as well as many other animals, have been observed to behave very differently in large groups than when alone. Under the influence of the social situation they may lose their accustomed fear and caution as is well shown by the following incident. In the late afternoon of Sept. 1, 1936 in Waldoboro, Maine, I observed Chimney Swifts (*Chaetura pelagica*) circling overhead in large numbers. They flew lower and lower until one side of their circle was barely skimming the ground. A tennis backstop of chicken-wire now stood directly in their path and into this they crashed blindly. At first they tried to pass between the meshes with their wings flapping. They would neither turn around nor fly over the obstruction. They seemed imbued with a mob psychology, a feeling that they must follow their companions regardless