male was present. The male Shoveler repeatedly chased a particular male Blue-wing, however, and I assume that this male was the original mate of the female Blue-wing. On 24 May, at 7:37 AM, my wife observed this male Shoveler directing his aggressive behavior toward one or two male Blue-wings of a group of four. Then, however, the female Blue-wing swam to the Shoveler whenever he got a short distance away. On 25 May, from 8:05 to 8:10 AM, the Shoveler was again associated with the female Blue-winged Teal. On this occasion, he threatened two male Blue-wings and two male Shovelers. He head pumped continuously and rushed at one male Blue-wing and a male Shoveler. The female Blue-wing did nothing but sit on the water. The Shoveler was able to keep all other males away from her. The last observation of this male Shoveler's aggressive behavior occurred on 28 May at 5:30 AM. At this time, I flushed him, a female Blue-wing, and a male Blue-wing from nesting cover. As they flew to water, the Shoveler was successful at keeping between the male and female Blue-wings, and repeatedly bumped the male Blue-wing in flight.

This series of observations is extremely similar to those reported by Dzubin (1959. *Blue Jay*, XVII (2):53–54) for an association between a Pintail drake (*Anas acuta*) and a Mallard (*Anas platyrhynchos*) pair. Nero (1959. *Blue Jay*, XVII (2):54) also reports an association between a male Green-winged Teal (*Anas carolinensis*) and a Mallard pair. Both authors cite these associations as possible explanations for the occurrence of hybrids in the wild. Childs (1952. *Condor*, 54:67–68) has recorded a hybrid intermediate between the Shoveler and the Blue-winged Teal. The aggressive behavior of this Shoveler resembles that described by Hori (1962. *Wildfowl Trust Fourteenth Annual Report*:129) for a paired drake of this species. He says, ". . . the paired drake attacks the pursuer and attempts to force him away by constantly interposing himself between his mate and the pursuer or by actually buffeting the latter." I concluded, therefore, that the drake Shoveler in question had formed a loose pair bond with the female Blue-wing.—GERALD F. MARTZ, *Wisconsin Conservation Department, Box D, Horicon, Wisconsin, 9 March 1964.*

Diagnosed diseases and parasitism in Rio Grande wild Turkeys.—During the course of Turkey trapping and banding activities in major winter roosting areas approximately 21 miles southeast of Sonora, Sutton County, Texas, three obviously diseased Turkeys (*Meleagris gallopavo intermedia*) were found out of 330 individuals trapped. These three birds were taken to the Sonora Sub-Station, Texas Agricultural Experiment Station, near Sonora, Texas, for examination and diagnosis. Veterinarians diagnosed the three diseased birds as having, respectively, infestation of scaly leg mites (*Knemidokoptes mutans*), enterohepatitis (*Histomonas meleagridis*), and fowl pox (*Borreliota* sp.).

There was only one published account of parasites or disease in the Rio Grande subspecies of the wild Turkey. This report concerned four species of lice found on a Turkey hen from Kleberg County, Texas (Hightower, Lehmann, and Eads, 1953. *J. Mammal.*, 34: 268–271).

This note is a contribution from the Texas Parks and Wildlife Department, Pittman–Robertson Project W-62-R.—JACK WARD THOMAS, *Texas Parks and Wildlife Department, Llano, Texas, 28 January 1964.*

A sound-triangulation method for counting Barred Owls.—During a study of population density of small mammals relative to surface water supply, certain related aspects have been observed. Among these is the presence, in the area of study (Section 31, Township 7 N, Range 5 E, Warren County, Mississippi) of a large number of predators. Especially noteworthy has been the Barred Owl (*Strix varia*).

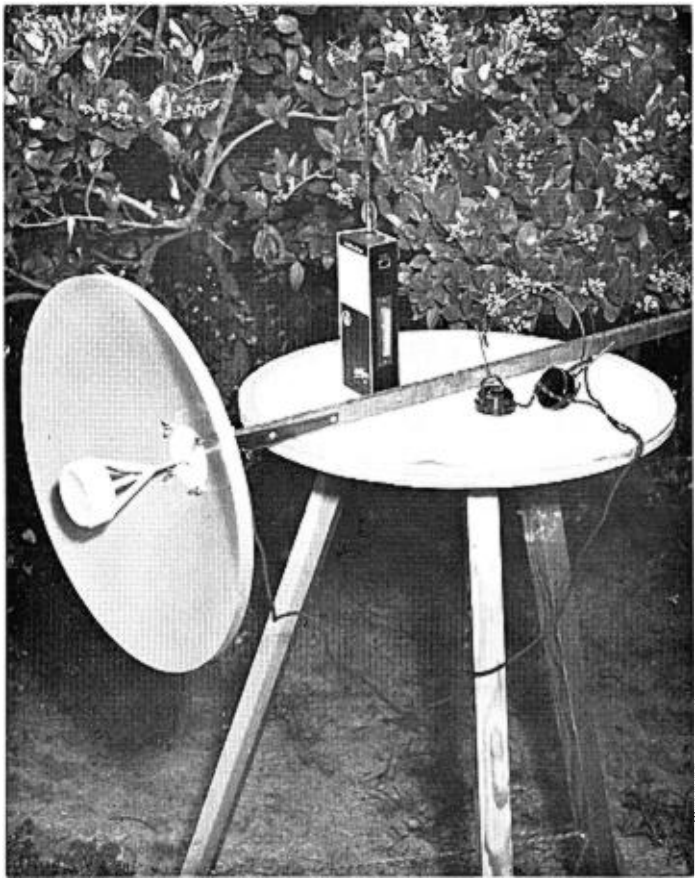

FIG. 1. Sound reflector mounted on plane-table.

A technique has been developed to determine the number of Barred Owls within the study area which may be referred to as a "sound-triangulation" sampling technique. It involves the use of large parabolic sound reflectors with inset microphones mounted on the drawing boards of plane-tables. The sound reflectors are positioned 0.6 mile apart. Communication between the two positions is by radio. The direction of the "hooting" is determined with the aid of the sound reflectors and plotted on plane-table sheets. The exact position of the owl can then be determined by simple triangulation.

Each sound reflector (see Fig. 1) is equipped with a steel straightedge (0.5 inch wide by 1 inch thick by 39 inches long) mounted opposite the inset microphone in the same vertical plane as the microphone. A circular plane-table sheet, 20 inches in diameter, is attached to the drawing board of each table and the sound reflector-straightedge apparatus is attached to a circular drawing board (22 inches in diameter) by means of a pin so that the sound reflector may be rotated 360° about the center of the drawing board. The sound reflector, straightedge, and drawing board are mounted on a tripod approximately waist high

so that the operator may bend over the board without resting against it. The board is leveled, but no special attempt is made to see that it is perfectly level each time a measurement is taken.

A reference line is drawn on each plane-table sheet toward magnetic north. The direction of the "hooting" of the owl is determined with the sound reflectors by rotating the sound reflectors on the drawing boards until maximum intensity and clarity of the "hooting" is heard. A line, which represents the direction from the station to the owl, is drawn along the straightedge on the plane-table sheet. At each plane-table station the angle from which the "hooting" sound is directed is plotted. Lines are drawn through the plotted angles from the base line, and the intersection of the two lines reveals the exact position of the owl during vocalization.

Direct counting of all individuals and census by sampling in this study area are impractical because of the nature of the area and the behavioral characteristics of the Barred Owl. This species hunts mostly by night and prefers to nest in a hollow in a tree. It is consistent in its attachment to its chosen nesting site (A. C. Bent, 1938. Life histories of North American birds of prey. Part 2. Dover Publications, Inc., New York, N. Y., p. 183.) The nocturnal habits of the owl and the fact that the courtship of the Barred Owl consists mainly of loud, spectacular vocal efforts, which are emitted by both sexes, are utilized in this sampling technique. The sampling is done at weekly intervals and the sampling period is from 1 to 3 o'clock AM. Certain assumptions are made using this procedure. They are: (1) that each owl within the study area will make its presence known by its characteristic "hooting" notes; (2) that the owls will not move either into or out of the study area, nor within the study area during each of the 2-hour sampling periods; and (3) that the "hooting" sound from any particular location represents one owl rather than several birds together.

Within the latitude of these assumptions, it is probably possible to determine the home ranges of the owls and fluctuations in the number of owls from time to time. Such probability is greatly increased by the nesting site constancy of the species, and by the great number of samples taken.—RONDAL E. BELL, *Millsaps College, Jackson, Mississippi, 23 January 1964.*

Black-legged Kittiwake in West Virginia.—Early in the morning of 25 October 1963, a telephone call was received from the local State Road Commission Office informing me that a large bird had been hit by a worker's car that morning. The specimen was at the commission garage. The bird proved to be a Black-legged Kittiwake (*Rissa tridactyla tridactyla*). The identification has been verified by George M. Sutton, and Maurice Brooks assured me that this is the first positive West Virginia record supported by a specimen. This bird was killed on U. S. Route 52 near Dunlow, about 25 miles south of Wayne, in Wayne County. The only other West Virginia record is a sight record of two birds observed on the Ohio River in Wood County by Earle A. Brooks about 1902 (Brooks, M. G., 1944. Checklist of West Virginia birds. *W. Va. Agricultural Experiment Station Bull.* 316).

In the fresh specimen the bill was black, the iris was brown, the legs were black, the skull was ossified, and the bird was slightly fat. The region of the kidneys and gonads was so badly crushed that determination of the sex was impossible. Dr. Sutton, however, called it an immature bird, probably a female.

Dr. Sutton supplied the following description: "Some scapulars strongly tinged with brownish and tipped with grayish white: these are, I believe, of the outgoing juvenal plumage. Dark parts: region in front of, and almost surrounding, eye; spot on auriculars; hind neck; lesser wing coverts and areas on outer webs of scapulars and tertials; alula,