of bill-sweeping which, in 2 years of trying to breed nuthatches, I had found impossible to induce at will.

J. G. Conklin of the University of New Hampshire and entomologists of the United States Department of Agriculture kindly identified the beetles as *Meloe angusticollis* Say. These beetles exude a copious, oily, vesicant fluid from coxal joints when handled and, being flightless, have short elytra that make the large abdomens of the females especially prominent. Unfortunately my captive nuthatches were unable to incubate their eggs successfully. Their nesting efforts ceased a few days after I had offered the blister beetle and I was unable to make further observations.

Much remains to be learned about bill-sweeping in White-breasted Nuthatches. Blister beetles might greatly facilitate further studies and experiments; they are available in numbers, are easily recognized, and excrete large amounts of a fluid that has vesicant and probably other biological properties as well.—LAWRENCE KILHAM, *Department of Microbiology, Dartmouth Medical School, Hanover, New Hampshire 03755.* Accepted 12 Feb. 70.

Mating activity of Ruffed Grouse.—Little has been reported on the sexual relationships of the Ruffed Grouse (*Bonasa umbellus*). Brander (Wilson Bull., 79: 28, 1967) followed three hens marked with radio transmitters through their mating activities in Minnesota. He concluded that the hen is attracted to the site of the cock's drumming performance, only a transitory pair-bond is formed, and the tendency for the cock to continue drumming afterward indicates a promiscuous mating habit.

On 13 April 1969 along Little Paint Creek in the Yellow River State Forest in northeast Iowa, we watched the mating performance of a male and female Ruffed Grouse. Our direct field observations support and add to Brander's (op. cit.) information.

At 04:55 we approached our blind near a group of five logs known to be used for drumming by a male grouse. Mirror traps had been left open but unset on two of the logs. The grouse flushed from one of the traps where it had apparently been roosting overnight beside its image in the mirror. We entered the blind and at 05:15 the birds returned to one of the logs and began drumming at intervals of 1½ to 2 minutes.

At 05:20 the bird stopped drumming, bobbed his head up and down 8–10 times, jumped off the log, and hurriedly proceeded toward our blind. A hen appeared, evidently in response to the drumming, and the male pursued her in a running display with neck feathers extended and tail held erect and fan-shaped. When the male intercepted her she took the position of a full squat, wings against the body and head held normally. The male immediately mounted her for a period of 8 to 10 seconds, and apparently copulation took place at 05:21. The female then moved out from under the male, assumed an upright stance, and vigorously ruffled her feathers once before she walked away. The male followed and renewed his display with neck feathers extended and tail held erect and fanned out. All this took place within 24 feet of the blind.

At 05:22 the female made a short flight to the limb of a fallen tree where she again ruffled her feathers. The male, still vigorously displaying, strutted on the ground below, occasionally bobbing his head. The female flew to the lower branches of a tree where she remained until 05:40, then flew to the ground out of sight behind a fallen tree. The male, continuing to display, strutted over to where the female landed. His movements at this time were slow and deliberate. We could see nothing more until the female flew away at 05:45. She had remained at the site 24 minutes.

At 05:48 the male mounted a log, drummed once, and then moved to an adjacent log with a trap on it. Confronted with his image in the mirror, the bird immediately dis-

played, held his wings out, and in a low crouch moved into the trap, pecking at the log as he went. He pecked lightly at the mirror several times, paced back and forth in the trap, and finally left the log and circled the trap twice. He then mounted the log behind the trap and pecked at it again.

At 05:53 the male moved to another log and began drumming at approximate 2-minute intervals. At 06:08 he left the log to feed for 3–4 minutes, then mounted the log with the trap again. Without displaying, he crouched with wings held out and rushed into the trap to peck briefly at the mirror. At 06:14 he returned to the log he had been drumming on and drummed at 2½- to 3-minute intervals, leaving once more to feed for approximately 5 minutes.

At 07:03 we left the blind, though the bird was drumming only 10 feet away. He left reluctantly and drummed immediately from another log within our view. As we advanced he moved to a log just out of sight and continued drumming. He remained in the vicinity of his drumming logs, and we trapped him later the same day. The same male continued to use these logs as a molting site through the summer, and we heard him drumming there twice in August.—H. Lee Gladfelter, *Iowa Conservation Commission, Wildlife Research and Exhibit Station, Boone, Iowa 50036,* and R. Scott McBurney, *Department of Zoology and Entomology, Iowa State University, Ames, Iowa 50010.* Accepted 3 Apr. 70.

Foliage-gleaning by Chimney Swifts (*Chaetura pelagica*).—Apparent gleaning of insects from leaves has been reported in Chimney Swifts by Fischer (New York Mus. Sci. Serv. Bull., No. 336: 1, 1958) and in Short-tailed Swifts (*C. brachyura*) by Collins (Bull. Florida State Mus., 11: 257, 1968). Neither author identifies the probable prey taken, but Fischer remarks (op. cit.: 104) that such "feeding would explain the occurrence, in a pellet, of species such as *Jalyaus spinosus* (Neididae, Hemiptera) which . . . belongs to a family of sluggish insects found in the undergrowth of woods and in meadows and pastures."

During the early afternoon of 5 August 1969 near Cobden, Union County, Illinois, I watched some 40–50 Chimney Swifts spend fully 20 minutes foliage-gleaning in a lofty grove of white ashes, tulip trees, sweetgums, and common cottonwoods. Some of the birds foraged in the manner Collins (op. cit.: 301) describes, in that they were seen "to bank sharply up and flutter briefly near the outermost branches of trees extending above the forest canopy," but most of them plummeted more or less tail first through the openings in the upper story, braking as when descending a chimney, to flutter briefly and glean among the leaves lower down in the canopy. I collected one of these swifts that had completed an incursion in a sweetgum, where presumedly it had seized the weevil found in its mouth, an adult *Cercopeus*, probably *C. chrysorrhaeus* Say. The weevil was identified in the Systematic Entomology Laboratory, U. S. Department of Agriculture, Washington, D. C., by Rose Ella Warner, who mentions (pers. comm.) she could find no previous record of *C. chrysorrhaeus* being eaten by birds. In a review of these weevils, Sleeper (Ohio J. Sci., 55: 274, 1955) says "occasionally the adults will be found feeding on foliage during the day, but with few exceptions they are night feeders, spending the day in leaf litter and rubbish around the host plant."

Foliage-gleaning in *Chaetura* and certain other swifts may be more common than now realized, and birds seen flying near or below the forest canopy should be watched carefully, as they could be removing insects from vegetation, even though foraging principally for airborne prey or gathering twigs for a nest.—William G. George, *Department of Zoology, Southern Illinois University, Carbondale, Illinois 62901.* Accepted 16 Feb. 70.