First specimen of Arctic Loon from Missouri.—The Arctic Loon (*Gavia arctica*) is known from few localities in the interior of North America; Palmer (Handbook of North American birds, vol. 1, New Haven, Connecticut, Yale Univ. Press, 1962, p. 45) lists but four records, none for Missouri. Only one sight record exists for Missouri, at Lake of the Ozarks, Gravois Mills, Morgan County (Easterla, Condor, 67: 544, 1965). On 19 October 1969 Floyd and Pearl Lawhon discovered an adult Arctic Loon in summer plumage at Browning Lake, Buchanan County, Missouri. After two unsuccessful attempts the senior author collected the bird on 23 October 1969. It was a male (testes 10 × 3.5 mm, moderately fat) that could fly (seen once flying the 1-mile length of Browning Lake) and appeared healthy in all respects. That the bird was still in summer plumage seems unusual, but Palmer (op. cit., 41) gives the definitive alternate plumage as lasting until October. Only the head and neck showed any suggestion of beginning molt. The bird weighed 4.93 pounds and its stomach contained unidentified fish and pebbles. The throat patch had both a purple and green sheen and the measurements (flattened wing 313.5 mm, tarsus 77.5 mm, bill from feathers 52.5 mm) were inconclusive for determination of the subspecies; *pacifica* would be the expected race (Palmer, op. cit.). As already suggested by Easterla (op. cit.), the Arctic Loon, breeding over most of extreme northern North America, may migrate more commonly through the interior than records indicate, especially in the autumn when immatures and winter-plumage adults could be easily overlooked and mistaken for the Common Loon(*Gavia immer*). The specimen was preserved as a study skin (CLJ 149) and is at Northwest Missouri State College.—David A. Easterla, *Department of Biology, Northwest Missouri State College, Maryville, Missouri 64468,* and Floyd Lawhon, *3327 Burnside Avenue, St. Joseph, Missouri 64505.* Accepted 10 Feb. 70.

Use of blister beetle in bill-sweeping by White-breasted Nuthatch.—I described in a previous communication (Auk, 85: 477, 1968) how White-breasted Nuthatches (*Sitta carolinensis*) sweep the bark in the vicinity of their nestholes while holding insects in their bills. Possible reasons for this behavior were not apparent until I had watched the nuthatches for a number of years. My final hypothesis was that tree squirrels are the chief competitors for the natural cavities these nuthatches use for nesting, and that the bill-sweeping may serve to deter or deflect squirrels by spreading repellent or other substances present in the bodies of the crushed insects. It was difficult to determine with field glasses and at a distance what species of insects were actually used. Twice I noted that when a female nuthatch came to her nest carrying a metal-blue beetle with a prominent abdomen and about 2 cm or more in length, she seemed impelled to sweep intensively both inside and outside her nest cavity until little of the beetle remained. She showed no interest in feeding the beetle to her nestlings. I was unable to find any similar beetle in the woods at the time. In May 1968 my wife, who had read my description, announced that she had found considerable numbers of the beetles in a dry field where they had gathered, apparently to copulate. The beetles appeared to be exactly like those I had seen through field glasses the year before.

I offered several of the beetles to a pair of nuthatches breeding in my aviary at the time. The female took a while to find one, but seizing it in her bill, she immediately started sweeping inside and outside of her nest cavity in the same manner I had noted in the field the year before. She was incubating eggs at the time and hence had no nestlings to feed. I had tried giving her a number of miscellaneous insects, including mealworm beetles (*Tenebrionidae*) on previous occasions, without precipitating bouts

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-