Flight speed of Arctic and Red-throated Loons.—The literature contains few records of loon flight speeds. Bent (U. S. Natl. Mus., Bull. 107, 1919) visually estimated the speed of the Common Loon (*Gavia immer*) at about 60 mph. Preston (Wilson Bull., 63: 198, 1951) calculated the speed of a Common Loon he followed in a car at 62 mph. Pittman (Wilson Bull., 65: 213, 1953) estimated the air speed of a Common Loon in a 15-degree dive at between 80 and 100 mph. Dixon (Auk, 33: 373, 1916) timed the Yellow-billed Loon (*G. adamsii*) at speeds of at least 40 mph on migration. I find no published records of the flight speed of the Arctic Loon (*G. arctica*) and the Red-throated Loon (*G. stellata*).

Substantial populations of Arctic and Red-throated Loons breed near the McConnell River, Keewatin District, Northwest Territories (60° 50′ N, 94° 25′ W). Both species nest on inland ponds and make regular feeding flights down the McConnell River to Hudson Bay.

We measured a 250-m course parallel to a straight section of the river and placed lines of flags at right angles to each end of it. Observers stationed at each end of the course and in contact by two-way radio timed the loons with a stopwatch as they passed between the flag sight-lines. Most loons flew low along the river, and we timed only those that flew less than 4 m above the water. Immediately after timing each flight we measured the wind speed at a height of 1 m with a hand-held wind gauge.

On 9 August 1968 wind speeds ranged from 13 to 24 kph directly against the loons' flight. Though the ground speeds of 10 Arctic Loons we measured that day ranged from 43 to 60 kph, their mean air speed was 71 ± 6.8 kph (44.4 ± 4.23 mph; range 36.6 to 49.5 mph). We clocked and calculated the air speeds of two Red-throated Loons at 75 and 78 kph (47.1 and 48.8 mph). We believe these calculated air speeds are accurate within 2 or 3 kph.

I wish to thank Graeme Stott for help in the field and C. D. MacInnes for assistance and equipment. This note is a by-product of a study of Arctic and Red-throated Loons supported in part by a grant from the Canadian National Sportsmen's Show.—ROLPH A. DAVIS, *Department of Zoology, University of Western Ontario, London, Ontario, Canada.* Accepted 16 Jan. 70.

A technique for sampling blood from small passerines.—It is sometimes necessary to obtain blood samples without introducing an aqueous borne anticoagulant into the sample (e.g. isotope dilution measurements). The method described here is often used on small mammals, but it is not yet widely used on birds and is suggested as an alternative to present methods.

Sampling from the jugular vein (Kerlin, J. Amer. Vet. Med. Assoc., 144: 870, 1964) is widely practised and is satisfactory for many studies. Our attempts to use this method without heparin resulted in hematomas for most birds and mortality in many cases. These results appear incompatible with the requirement that the birds be relatively unaffected by the sampling procedure and that a second sample be taken in less than 24 hours.

Another accepted technique is a heart puncture through the furcular region. This is a basic technique used in the laboratory on gallinaceous and columbiform birds (P. N. Brody, pers. comm.). We were unsuccessful in attempts to obtain blood from small passerines without mortality using this technique. The procedure has been used with success, however, by H. W. Kale II (pers. comm.) and R. E. Kerlin (pers. comm.).

The alternative method involves a heart puncture through the sternum. The bird is held in one hand with the head aimed toward the worker and the feet restrained firmly

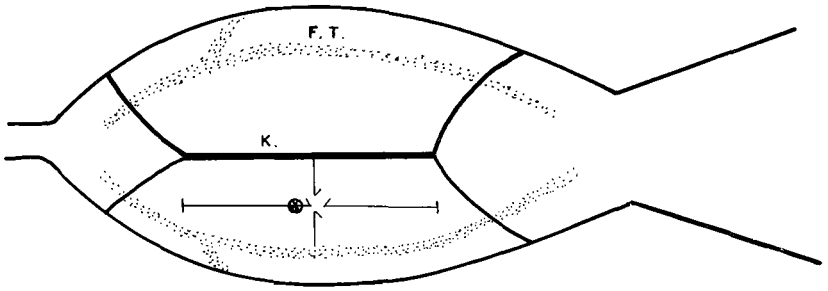

Figure 1. Diagram of ventral surface of birds showing location for heart puncture, ⊗. F.T. = ventral feather tract; K. = keel.

by the second and third fingers. If an assistant is available one person can hold the bird while the other takes the blood sample. Breast feathers should be moistened with alcohol so that the breast area is fully exposed. Location for the puncture (Figure 1) can be established by simple measurements. The anterior-posterior coordinate is slightly cephalic of one-half the length of the keel. The lateral coordinate is on the bird's right side, one-half the distance between the keel and the ventral pteryla. The needle is inserted through the sternum and into the heart directly below the sternum at an angle of approximately 10° from the vertical. If the needle encounters more than a slight resistance, it should be withdrawn and the point moved slightly. Occasionally the heart is in a different attitude, such as near the caudal end of the sternum. This position can be determined by feeling along the breast for the heart beat, and the puncture site so modified. It is very important that the puncture be slow and steady to avoid a sudden slip that would penetrate other organs. As soon as the needle goes through the sternum, the plunger should be very slowly withdrawn as the needle is inserted further to make sure that the point does not pass completely through the heart. We generally use 26-gauge 1-inch needles, but have also used successfully 22- and 24-gauge and ⅝-inch needles.

The method has been tested on a variety of small birds. It was first used by LeFebvre (Auk, 81: 403, 1964) on pigeons (*Columba livia*) and on Purple Martins (*Progne subis*) (Utter and LeFebvre, Comp. Biochem. Physiol., in press) where the birds flew at least 144 km immediately after the heart puncture. We have also used it in studies in which birds were recaptured 2 or 3 days after the initial blood sample was taken. We found no indication of impaired health in these birds and no significant change in weight at the end of the period. Their behavior and activity showed no apparent adverse effects as compared to birds banded and released without bleeding. Preliminary studies performed by LeFebvre on anesthetized pigeons in conjunction with internal inspection indicated no bleeding through the ventricular walls and no apparent local damage following heart puncture. Other species from which we have drawn blood in this way are Catbird (*Dumetella carolinensis*), Robin (*Turdus migratorius*), Rufous-sided Towhee (*Pipilo erythrophthalmus*), Mockingbird (*Mimus polyglottos*), Brown Thrasher (*Toxostoma rufum*), Common Grackle (*Quiscalus quisqula*), Song Sparrow (*Melospiza melodia*), Grasshopper Sparrow (*Ammodramus savannarum*), White-throated Sparrow (*Zonotrichia albicollis*), and Slate-colored Junco (*Junco hyemalis*).

Samples have ranged from 0.1 to 0.4 cc of blood. We have attained 100 per cent survival of bled birds in recent studies using this technique.

The reason for the greater mortality incurred using the furcular approach in comparison to the sternal stab with passerines is presently unknown. One possibility is that the thinner atrial wall collapses when punctured. Because of the position of the heart the furcular stab enters an atrium while a proper sternal stab goes directly into the ventricle. Another possibility is that in the furcular approach major vessels may be ruptured, though this was not evident when the birds were autopsied after the failure of a furcular stab. As young chicks are routinely sampled by the furcular approach, size does not appear to be the critical factor.

This paper is a result of research supported by the National Science Foundation, GB 3343 to Rutgers University, and GB 6158 to the University of Minnesota; Southern Illinois University; and The Chapman Memorial Fund of the American Museum of Natural History, New York. Assistance in the field was given by K. Schwaab and S. Utter. P. N. Brody assisted with trials in the laboratory. H. F. Frankel, P. N. Brody, and H. W. Kale II suggested improvements in the manuscript for which we are grateful.
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Killdeer breeding range extension.—For the Gulf of St. Lawrence region Godfrey (Natl. Mus. Canada, Bull. 203: 134, 1966) lists the Killdeer (*Charadrius vociferus*) as an uncommon breeder in New Brunswick, a rare breeder in Nova Scotia and Prince Edward Island, and a nonbreeding casual in Newfoundland. While afield in western Newfoundland from 7–30 June 1968 and in the Magdalen Islands, Quebec from 15 May to 7 June 1969, I found evidence the Killdeer breeds in both places.

On 27 June 1968 in a pasture near the mouth of the Grand Codroy River about ½ mile west of Searston, St. George's District, Newfoundland, I found a Killdeer brooding two downy young that I caught, photographed, and released. This is the sixth record for the species in Newfoundland and the first of its breeding there.

On 16 May 1969 I saw a Killdeer in a cow pasture near a pond about 1 mile north of Étang des Caps, Bassin, Magdalen Islands. The species was previously unrecorded on the Magdalens (Gaboriault, Naturaliste Canadien, 88: 166, 1961). During the week of 18 May I heard a Killdeer calling in Fatima, and on 5 June I found an adult about ½ mile east of Cap de l'Hôpital and another in a cow pasture east of Chemin de l'Aéroport, Fatima. As I watched from about 250 yards, two more adults joined the first bird. When I went to the spot, they flew and ran about me excitedly, with one performing a low intensity distraction display. I found two well-formed scrapes but no eggs or young.

These records extend the known breeding range of the Killdeer about 50 miles north and about 130 miles east. If Finch (Audubon Field Notes, 23: 13, 1969) is correct that Killdeer are still establishing themselves in Nova Scotia, then future increases can also be looked for in Newfoundland and on the Magdalen Islands. My field studies were supported in part by a grant from the National Science Foundation (GB-8212) to N. G. Hairston, The University of Michigan, for research in systematics and evolutionary biology.—JOSEPH G. STRAUCH, JR., *Museum of Zoology, The University of Michigan, Ann Arbor, Michigan 48104.* Accepted 27 Jan. 70.