species as shy and retiring and states that they seldom show themselves in the open. Twice, at least, I observed the bird under conditions which would seem to controvert this statement.

A Loon (*Gavia immer*), was picked up on the golf links, Ft. Lauderdale, Fla., February 14, 1922. The bird appeared to be uninjured and submitted, without resentment, to stroking and handling. It made one or two attempts to paddle away, using only its feet, but made little progress. Finally it was carried to the river, about three miles away, where it dove and splashed with evident enjoyment.

The golf links are about as far from the ocean as from the river. The country round about consists of pine land, cut-over land overgrown with palmetto scrub and some truck gardens. It may be that the links, set in an opening of this scrub growth, being nearly level and perhaps covered with mist at night, appeared to the bird as a body of water and that, once down, it was unable again to rise. I think most accounts agree that a Loon is unable to rise save from the water.—Edw. R. Ford, *Grand Rapids, Mich.*

Birds Using their Wings as a Means of Propulsion under Water.—Mr. Charles W. Michael and his companion can be congratulated on the excellent photographs and extremely interesting article on the Harlequin Duck which appeared in 'The Auk' for January, 1922. Closely watching various species of diving birds, an observer notes two distinct means of propulsion under water: (I) by the use of the wings which are not fully expanded in this swimming below the surface, but are bent at the carpal joint; (II) by using the feet alone.

Having for many years had opportunities of observing the Murre (*Uria troille troille*), Razor-billed Auk (*Alca torda*), and Puffin (*Fratercula arctica arctica*), diving when the water was clear, around the coasts of Scotland, I can confirm the statement that these species all use the wings for propulsion, that is to say, the Auk family make use of the wings when travelling beneath the surface.

The Manx Shearwater (*Puffinus puffinus puffinus*) does the same, although of course it is not such an inveterate diver as the Auks. The other big petrel, the Fulmar, is said to do the same but I cannot speak of this bird from personal experience.

In Class II there are Loons, Grebes, Mergansers and Ducks. Close to my home, on the Lower Arrow Lake, B. C., there is a beaver dam, where almost any day may be seen Buffleheads, Golden-eyes, Coots, Mergansers and occasionally other species as well, diving at pretty close quarters. The water is still, and usually quite clear. Here these birds use the paddles alone for propulsion under water. The following is the mode of precedure with them when feeding.

A Golden-eye or Buffiehead floating on the surface which is about to dive, may or may not submerge a little before doing so, and may occasion-

ally partially open the wings before plunging headforemost beneath the surface. Very little disturbance of the water takes place when diving. it is more a slipping beneath the surface, which is often effected by a slight spring, forward, not by a leap out of the water as is generally the case with grebes. Under water the wings are closed, the tail spread, the paddles work alternately, being thrown vigorously backwards and outwards, thus avoiding the edge of the spread tail, and are sometimes thrown back so far that they appear to reach a little higher than the back. The tail is sometimes depressed, sometimes elevated, to adjust the angle the bird wants to maintain. When bottom is reached the body is held down by the strokes of the paddles, generally at an angle of about 45°, while the bill rakes the mud. Occasionally the bird slightly loses its balance and rolls over a little, when a wing is shot out, but the moment balance is restored the wings are kept closed, the paddles doing all the work.

The return to the surface is by buoyancy alone, the head breaking water first, the body sloping slightly downwards, though sometimes the duck pops up horizontally, the feet are not used in rising to the surface.

One October morning I was lying concealed in my sneak-boat in the very shallow narrow outlet of a remote slough, when a female Golden-eye evidently mistaking the boat for a log, came feeding slowly past me, within a few feet of the punt, the water was so shallow that when she submerged there was only a thin film over her back.

The paddles were thrown back with great force, and appeared sometimes to reach a little higher than the level of the back. The bottom being soft she could not have obtained any foothold by walking.

A male Merganser is very conspicuous under water, using the feet alone for propulsion, and can travel at an extraordinary pace in this submerged swimming.

Very interesting is the observation made by Mr. Michael that the Harlequin uses its wings under water, and walks over a gravel bottom.

Is the Harlequin an exception to the general rule, or do all diving ducks have to use their wings in a current? Even here perhaps, they are used more to retain balance than as natatory organs. All of my observations on diving ducks have been in waters where there was little or no current.

The Coot also uses its feet when diving. This clown among birds may often be seen after a short dive to pop up tail first.

Mistakes may be made when observing birds under water, especially if the water is not very clear, light may strike the tail or paddles, and make it appear as if the wings were employed. There is little use in observing wounded or captive birds, for a broken wing or even broken wing tip may easily give the impression that the wings are used.

Guillemots or Razor-bills when confined in a comparatively small aquarium, feeding on the dead or moribund fish supplied them, may give up using their wings and reach their food with a few kicks of the feet.

In this case the birds appear at first to use their wings which often come in violent contact with the glass; this apparently soon teaches them that the use of the wings is both superfluous and painful.

I have not so far observed a Harlequin in the Beaver Dam, though they are not very uncommon on the Arrow Lakes.—J. E. H. Kelso, M. D., *Edgewood, Lower Arrow Lake, B. C.*

Bird Catastrophe at Gordon, Nebraska.—The morning papers of February 20, 1922, carried the news that on the previous night thousands of birds were killed at Gordon, Nebraska, during the blizzard and that no one in the town was able to identify them. I immediately wrote the mayor, Mr. Frank Coates, and asked him to mail me a specimen for identification along with full particulars concerning the storm. He very kindly sent me two specimens. I found them to be Lapland Longspurs (*Calcarius lapponicus lapponicus*). To confirm my verdict I mailed one bird to the Bureau of Biological Survey, and from it received word that my identification was correct. The following information was furnished by the mayor of Gordon.

At six o'clock on the evening of February 19, the temperature was 34 degrees above zero. During the night it stood at 16 degrees above. Early in the evening (Sunday) a sleet fell, followed by a fall of one inch of snow. There was no wind and the snow was evenly distributed. At 10 P. M. the birds were flying against the cluster lights in such numbers that the lights were turned off. Next morning before one store having dim lights fifty-five birds, dead or nearly so, were counted. A conservative estimate as to the number killed was twenty-five to a city block. Thousands were killed in the surrounding country, the morality extending over a territory ranging 200 miles both east and west of Gordon.

'The Auk', volume XXIV, for October 1907 gives an account of a similar tragedy which occurred in Minnesota in 1904.—Bessie Price Reed, *Lawrence, Kansas.*

Flight Songs and Mating Songs.—The interesting paper by Mr. Aretas A. Saunders on 'Flight Songs and Mating Songs' in the April number of 'The Auk' brings up several questions. Of the birds that are in the habit of singing from perches, a certain number—possibly more than we know—indulge at times in flight songs which generally differ more or less from the ordinary song. The fact that many birds continue their songs, both ordinary and flight, long after the courtship season, does not, it seems to me, prevent these being true courtship songs. The Robin sings even into August and the Song Sparrow has been known to sing every month of the year. The songs of most birds deteriorate as the season advances.

The full song of the Black and White Warbler, to which Mr. Saunders refers, is in my experiences common during the courtship season, but may