

## SPEED OF BIRD FLIGHT.

COMPILED BY MAY THACHER COOKE.

DEFINITE records of the speed of bird flight are sometimes hard to find. Quite a few such records exist; but they are scattered, many in publications not readily accessible. In order to facilitate further study of this interesting subject it seems desirable to bring together these records for North American species, where they will be readily available.

Scattered through sportsman's magazines are many so-called records of the speed of game birds, most of which are estimates based on calculations that were at best largely guess work. In recent years, however, the air-speed indicator and automobile speedometer have given means by which individuals of many species have been definitely timed. Also studies have been made of birds flying across measured distances, timed by stop watches and theodolites. These are furnishing a fairly definite understanding of the rate at which birds of different kinds fly, and in general the speeds so determined are much lower than was formerly supposed.

Some of the smaller Passeres have been found to make less than 20 miles per hour in ordinary flight, and records of ducks and geese averaged little over 40 miles per hour. At the other extreme is the hunting Peregrine. Portal, an experienced falconer, estimates this bird's average maximum speed of level flight through still air as 62 miles per hour, and some have estimated that it strikes its prey at 150 miles per hour. McLean timed a Duck Hawk hunting over a 400-yard field in California, whose average speed was over 165 miles per hour and whose greatest speed was 180 miles per hour. Extreme as these speeds seem, they are possibly exceeded by some of the Swifts.

Ten years ago Col. Richard Meinertzhagen published in 'The Ibis' a very comprehensive article in which he collected and analyzed the available information on this subject. He reported, as the experience of aviators, that geese can accelerate very little, but that ducks when pressed can speed up to about 60 miles per

hour. He concluded that birds have two speeds, "a normal rate which is used for every-day purposes and also in migration, and an accelerated speed which in some cases nearly doubles the rate of their normal speed." This accelerated speed, however, cannot be maintained for any length of time.

Several recent articles on the mechanics or aeronautics of bird flight are not included in the following annotated bibliography which shows the sources and nature of the material summarized in the appended table.

BASSETT, FRANK N.

1921. The Speed of a Flying Dove. *Condor*, vol. 23, p. 190-191.

[BRUETTE, WILLIAM].

1917. Birds and Aviators. *Forest & Stream*, vol. 87, p. 603. (Ducks average  $65\frac{1}{2}$  miles per hour when flying upwards; 69 miles per hour when flying horizontally [air speed?].)

CLARKE, W. EAGLE.

1912. Studies in Bird Migration. London, Gurney & Jackson, 2 vols. 8vo. II. p. 29. (Records of skylark and starling.)

CLAYTON, H. HELM.

1897. The Velocity of a Flight of Ducks obtained by Triangulation. *Science*, New Series, vol. 5, p. 26. (The Height and Velocity of the Flight of a Flock of Geese migrating northward. *Ibid.* p. 585-586. Measured by theodolites.)

GLADSTONE, HUGH S.

1922. Record Bags and Shooting Records. London, H. F. & G. Witherby, 240 pp., 8vo. (Chapter, "The Speed of Birds," p. 173-197, quotes many published records and discusses the effect of wind on speed of flight.)

GRINNELL, GEORGE BIRD.

1881. Flight of Birds. *Forest & Stream*, vol. 17, p. 247. (Data for pigeons.)
1901. American Duck Shooting. New York, Forest & Stream Publishing Co., 623 pp., 8vo. p. 509-510. (A flock of Pintails flew some distance parallel to a train going 52 miles per hour.)
1903. Timing the Flight of Birds. *Forest & Stream*, vol. 41, p. 375. (Data for pigeons, pintail, and starlings.)

HARRISSON, T. H.

1931. On the Normal Flight Speed of Birds. *British Birds*, vol. 25, p. 86-96. (Speeds carefully timed by auto or motorcycle speedometer. Data for 36 species. Bibliography.)

HAYES, SAMUEL P., JR.

1929. Speed of a Flying Hummingbird. *The Auk*, vol. 46, p. 116.

HOLLAND, RAY P.

1924. How Fast Can a Quail Fly? *Outdoor Life*, vol. 53, p. 70. (Aviators say that at 65 miles per hour they can overtake the fastest ducks.)

How Fast Can a Quail Fly? *Ibid.*, p. 151. (Timed with stopwatch from time bird flushed until second barrel was fired; estimated about 48 miles per hour.)

JONES, LYND S.

1927. Highway Mortality and Speed of Flight. *Wilson Bulletin*, vol. 39, p. 8-10. (Long-billed Curlew and flock of gulls timed by auto.)

LONGSTREET, R. J.

1930. Notes on Speed of Flight of Certain Water Birds. *The Auk*, vol. 47, p. 428-429. (Twelve species timed by auto speedometer.)

MARTIN, EDWARD T.

1916. The Speed of Ducks. *Forest & Stream*, vol. 86, p. 1147. (Diving ducks faster than puddle ducks; teal not so fast as Canvasback and Scaup.)

MCLEAN, D. D.

1930. The Speed of Flight in Certain Birds. *The Gull*, vol. 12, no. 3. (Discusses the speed of 13 species timed by auto speedometer.)

MEINERTZHAGEN, RICHARD.

1921. Some preliminary remarks on the Velocity of Migratory Flight among Birds, with special reference to the Palaearctic Region. *Ibis*, p. 228-238. Reprinted in *Smithsonian Report for 1921*, p. 365-372. (The most comprehensive discussion of the subject.)

MUNSON, EDWARD L.

1930. Timing the Ducks. *Field & Stream*, vol. 35, p. 18-20, 70. (Tests made by airplane, chasing ducks; i. e. gives the maximum speed of which the birds were capable; five species.)

[MURPHY, WILLIAM W.]

1905. How Fast do Birds Fly? *Forest & Stream*, vol. 65, p. 330. (Engineer of fast train has raced birds flying parallel to or ahead of his engine; five species.)

PHILLIPS, JOHN C.

1922. A Natural History of the Ducks. Vol. I, p. 22-23. (Some diving ducks faster near ground than Mallard-like species. Extra speed of teal more apparent than real. 40-50 miles per hour, common speed in migration; 55-60 miles per hour possible by some species.)

PORTAL, C. F. A.

1922. The Speed of Birds. *Field* (London), vol. 139, p. 233-4. (Speed is partly individual, one partridge of a covey was seen to fly 15 per cent faster than the others when all were at full speed. Author, an experienced falconer, gives average maximum speed of level flight through still air of seventeen species.)

## E. P. R.

1913. How Fast Do Ducks Fly? *Forest & Stream*, vol. 80, p. 41.  
(Conductor said train often raced ducks and at 50 miles per hour the train usually won.)

## RADCLIFFE, C. E.

1922. The Speed of Birds. *Field* (London), vol. 139, p. 234. (The heaviest bird of a given type is the fastest when it gets going. Quicker flush and rise of smaller bird deceptive. No bird can beat a Peregrine Falcon.)

## RITTER, C. B.

1910. Speed of Birds and Animals. *American Field*, vol. 73, p. 200.  
(Observations of a locomotive engineer.)

## ROBINSON, H. W.

1922. What is the Fastest Bird? *Field* (London), vol. 139, p. 138.  
(Considers Merganser going down wind one of the fastest of all birds.)

## WETMORE, ALEXANDER.

1916. The Speed of Flight of Certain Birds. *Condor*, vol. 18, p. 112-113. (Seven species timed by auto speedometer.)

## WHITE, FRANCIS BEACH.

1927. Birds and Motor Cars. *The Auk*, vol. 44, p. 265-266.  
1929. Birds and Motor Cars. *The Auk*, vol. 46, p. 399. (Speeds of thirteen species of Passeres.)

## WOOD, HAROLD B.

1923. The Speed of Flight of Birds. *Bird-Lore*, vol. 25, p. 121. (Records of eight species timed by auto speedometer.)

Species	M.p.h.	How timed	Locality	Authority	Remarks
Gulls, sp.	25	Boat	Irish Sea	Gladstone	Accompanied mailboat without effort.
" "	30	Auto	California	Jones	Flock of 12 paced for half an hour.
Herring Gull	17-20	"	England	Harrison	Three observations; very easy flight.
" "	12	"	"	"	Planing near ground for 50 yards.
Common Tern	25, 27	"	Florida	"	Easy flight.
Black Skimmer	18	"	"	Longstreet	Two birds over 3 miles, wind ahead.
Gannet	25	"	"	"	Four birds, wind ahead.
" "	48	Airplane	England	Meinertzhagen	Air speed.
Cormorant	20	Auto	Florida	Longstreet	Four birds, wind ahead.
Brown Pelican	26	"	"	"	Four birds for 8 miles, wind abeam.
Ducks, sp.	47.8	Theodolites	Mass.	Clayton	Light wind.
" "	47½	Kites & Stop watch	N. J.	E. P. R.	Ordinary flight, average of 20 observations.
" "	44	Train	Missouri	Murphy	Hunter pumping repeating gun.
Mallard	50	Airplane	?	Meinertzhagen	Air speed.
" "	50-	"	France	"	"
" "	58	?	England	Portal	"
"	55 ±	Airplane	California	Munson	Average maximum speed of level flight through still air.
Cinnamon Teal	32-59	Auto	"	McLean	Flock chased, top speed. Air speed.
Shoveler	47, 53	"	"	"	Bird speeded to higher speed, another 49 miles per hour.
Pintail	65 ±	Airplane	"	"	Two different birds, easy flight.
"	55	Train	Arizona	Munson	Flock chased by plane. Air speed.
Redhead	42	"	Colorado	Grinnell Ritter	Flock drew away from train Flew near train for 50 miles.

Species	M.p.h.	How timed	Locality	Authority	Remarks
Canvasback	72±	Airplane	California	Munson	Flock chased, top speed. Air speed.
Goldeneye	50—	Train	New York	E. P. R.	Train at 50 miles per hour passed in ½ mile flock that had been shot at.
Snow Goose	50±	Airplane	California	Munson	Flock chased, top speed. Air speed.
Canada Goose	44.3	Theodolites	Mass.	Clayton	Light wind.
Brant	45	Airplane	Scotland	Meinertzhagen	Air speed.
Swan	45±	"	California	Munson	Flock chased, top speed. Air speed.
Great Blue Heron	28	Auto	"	Wetmore	Two observations.
Green Heron	34	Auto	California	McLean	Steady, easy flight, 25 ft. alt.
Long-billed Dowitcher	43	"	"	"	Five birds in easy flight, 200 yards.
Semipalmated Sandpiper	32	"	Florida	Longstreet	Flock, wind abeam.
Western Sandpiper	44, 52	"	California	McLean	Two birds, level flight.
Sanderling	41	"	Florida	Longstreet	Wind behind, about 10 miles per hour.
Willet	27	"	Florida	"	Wind ahead.
Long-billed Curlew	35	"	"	Jones	For ½ mile, bird tried 3 times to alight.
Hudsonian Curlew	34	"	Florida	Longstreet	Two birds for 7 miles, wind abeam.
Black-bellied Plover	24	"	"	"	Wind abeam.
Golden Plover	62	Train	Illinois	Martin	Beat with ease train going 58-62 miles per hour.
Killdeer	28-55	Auto	California	McLean	Individuals vary greatly; 3 observations, fastest seemed to be playing in air.
Semipalmated Plover	32	"	Florida	Longstreet	Flock, wind behind.
Bobwhite	48	Stop watch	South Carolina	Holland	Birds flushed, top speed.

Species	M.p.h.	How timed	Locality	Authority	Remarks
Ruffed Grouse	22	Auto	New Hampshire	White	
Mourning Dove	30	"	California	Bassett	Bird frightened.
"	32	"	Kansas	Wood	
Turkey Vulture	21	Train	Missouri	Murphy	
Western Redtail	22	Auto	California	Wetmore	
Swainson Hawk	15	"	Kansas	Wood	
Duck Hawk	165-180	Stop watch	California	McLean	Hunting
Peregrine Falcon	62		England	Portal	Average maximum level flight through still air
Eagle				Murphy	When chased can beat train.
Sparrow Hawk	22-25	Auto	California	Wetmore	Two observations.
Kingfisher	36	"	"	McLean	Steady flight apparently little effort.
Flicker	20-25	"	New Hampshire	White	Two observations.
Red-shafted Flicker	43, 44	"	California	McLean	Slightly startled.
Ruby-throated Hummingbird	45	"	Pennsylvania	Hayes	200 yards, easy flight.
Scissor-tailed Flycatcher	10	"	Kansas	Wood	
Kingbird	15	"	New England	White	
Arkansas Kingbird	17	"	Kansas	Wood	
Horned Lark	23-28	Auto	California	Wetmore	Six observations.
"	17, 23	"	Kansas	Wood	Two observations.
"	32, 54	"	California	McLean	Two observations. Slower in ordinary flight.
Magpie	19	"	England	Harrison	
Blue Jay	20	"	New England	White	
Raven	24	"	California	Wetmore	

Species	M. p. h.	How timed	Locality	Authority	Remarks
Crow	60—		New York	Martin	Could just about keep up to train going 58-62 miles per hour.
Starling	35-40	Boat	North Sea	Clarke	Migrating birds.
"	18	Auto	New England	White	
"	44		England	Portal	Average maximum level flight through still air.
"	40-45		India	Grinnell	Going to roost.
"	43-49	Stop watch	England	Meinertzhagen	13 observations.
"	25-30%	Auto	Palestine	Harrisson	7 observations.
"	45-48½	Theodolites	Germany	"	22 observations.
"	46.5	?	California	"	
Tri-colored Blackbird	46-52	Auto	California	McLean	46 and 48 to and from nest. Flock flew at 52 miles per hour.
Meadowlark	20	"	Kansas	Wood	
Baltimore Oriole	12	"	"	"	
"	26	"	New Hampshire	White	
Bronzed Grackle	27, 30	"	"	"	2 observations.
Vesper Sparrow	17	"	"	"	
Savannah Sparrow	37-42	"	California	McLean	First speed apparently easy, second maximum.
Song Sparrow	17	"	New Hampshire	White	
Indigo Bunting	20	"	"	"	
Barn Swallow	44-46	"	California	McLean	Easy flight.
Bank Swallow	31	"	England	Harrisson	Chased by car
Shrike	28	"	California	Wetmore	
Catbird	16	"	New England	White	8 observations.
Robin	20-32	"	"	"	"
Bluebird	17	"	"	"	2