

SPEED OF BIRDS

BY AUSTIN L. RAND
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A FLEA travels at the rate of 4.5 miles per hour in 8-inch jumps. This I discovered in a recent account of speed of animal locomotion. Though I had no immediate use for this datum, it did set me thinking about animals and speed. How fast a bird flies or an animal travels is a question we commonly are confronted with at the Museum. We usually look up the appropriate table in the most recent textbook and read out the answer. But I've

ascending waterfalls. A varanus lizard in Egypt did 14 miles per hour on a dash to a hole, but the dreaded, deadly black mamba snake could not exceed 7.2 miles per hour over short grass in Kenya, and a hungry giant tortoise in Mauritius moved at 1/6 mile per hour toward food. A cheetah chasing an electric hare on a race course at 44 miles per hour was the fastest mammal.

HUMAN SPEED

Then I came to man: a man may walk from two to four miles per hour; on a mile race he may run at the rate of 12 miles per hour; in a 100-yard dash he may approximate a rate of 20 miles per hour. But to say that man's top speed is 20 miles per hour, implying that 15 minutes would be enough to get from his home to the office five miles away, is not a sound piece of information. Nor can I imagine a flea setting out to travel a mile in 8-inch jumps when he could hop on a dog and travel at the rate of 40 miles per hour (top greyhound speed).

But it was the speed of birds that interested me most. Notable was the fact that the recorded speeds are very variable. Horned lark records, for instance, ranged from 17 to 54 miles per hour. But variability must be taken into account and may depend on a variety of factors. For instance, ground speed is not the same thing as air speed. With a good wind behind it a herring gull might double its ordinary speed, from 30 to 60 miles per hour. An eider duck has a maximum speed of 50 miles per hour, but Meinertzhagen saw one flying into a heavy gale that actually had a minus ground speed, approaching him backwards as it tried to fly away.

said to be unable to catch pigeons in level flight but by diving on them from a height can gain enough impetus to do so. However, I once saw a duck hawk easily overtake a teal, one of our fastest ducks, in level flight. A golden eagle, that probably does not reach 60 miles per hour in much of its flying, has been credited with an estimated speed of 570 miles an hour on a mile-long dive. Migration flights of birds are said to be much faster than the ordinary flight. Starlings often move about at 20-30 miles per hour, but when they get up to travel approach 50.

The length of time a speed can be maintained is a point on which we have no data. Presumably birds can speed up greatly for short spurts.

Then there are speed records we wonder at: Indian spine-tailed swifts that were measured over a course at about 200 miles per hour, and frigate birds traveling at 261. A museum man has much of his raw material housed for permanent reference. His specimens can be remeasured and checked against standards. Time and again a controversy has been settled in this manner. But these scattered data on speed permit no check. A project set up to accumulate new data by having trained birds fly a measured course would be very expensive and time-consuming for such data as would be secured, and the limited use that could be made of it.

But the speed of birds is a legitimate subject of interest and we will have to make do with the scattered data gathered incidentally as opportunity offers. However, until we can separate out the various types of flight: those aided by wind or given impetus by a dive, leisurely cruising or a hurried dash to safety, or long range traveling, we must be satisfied with very general answers.

GENERAL ESTIMATES ON BIRDS

The following are some general estimates of the speed of birds in calm air in level flight:

10-20 m.p.h.: Many small perching birds—sparrows, wrens, catbirds, flycatchers

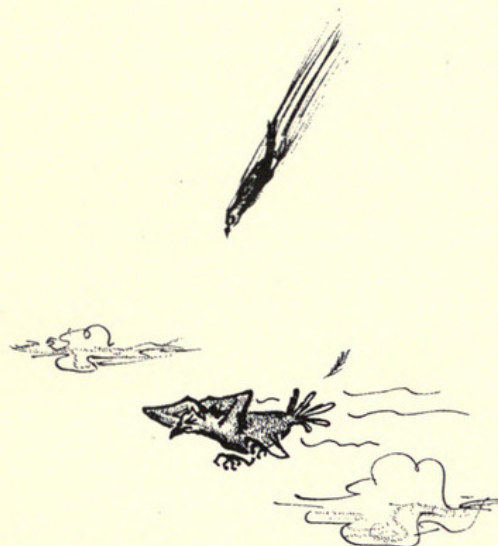
20-30 m.p.h.: Many medium-sized birds often move in this range—as robins, grackles, meadowlarks, and some larger, broad-winged birds like herons, pelicans and gulls

20-40 m.p.h.: Many small and medium-sized birds move in this range—starlings, chimney swifts, flickers, mourning doves

40-60 m.p.h.: The faster flying birds—like falcons, ducks, geese, and rock doves—often travel in these ranges

Perhaps the most productive approach in further study will be to make comparative studies to determine which birds can overtake other birds.

As to the extreme records, comparable to man-made records in airplane, car, boat, or

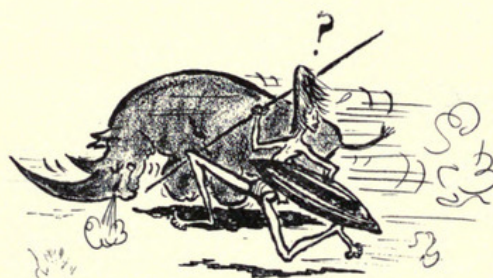


Cartoons by Ruth Andris

long had the feeling that these weren't very good answers. So I welcomed the stimulus given by the flea information, and that about mosquitoes flying at one mile per hour, and a Masai warrior, one of the celebrated lion spearmen, with shield and spear running at 18.4 miles per hour when pursued by a rhino, and a rhino trotting at 27.2 miles per hour when pursuing a Masai warrior but galloping at 32-35 when charging a motor car.

I browsed through the surveys of Meinertzhagen and Roberts of England, and of Cooke and Lane of the United States. They contained records from the United States, Europe, Africa, Asia, and Australia, gathered at various times by various persons. The standards of precision may have been different and the methods of calculating were often very different. Some were made by pacing the animals with automobiles or airplanes; some by using range finders; some by timing over measured courses; some were made with "instruments"; and some were merely estimates. Only occasionally were the conditions given: tail wind, frightened, etc.

There were records of mayflies at one mile per hour; butterflies and houseflies at 5 miles per hour; horsefly types at 40, and dragonflies at 60. A 20-pound salmon, freshly hooked, took out line at 10 miles per hour while salmon are credited with 14-17 when



The question as to whether or not a bird is doing its best makes a difference, too. A crow in India that cruised at 25 miles per hour in the shelter of trees speeded up by an additional 10 miles per hour when it was crossing open fields where attack was likely. Kingbirds are recorded as making only 11 and 15 miles per hour, but I have seen one overtake and strike a fleeing crow that was certainly doing more than the 26 miles per hour credited to it.

570-M.P.H. DIVE

Pigeons may fly in the neighborhood of 40 miles per hour, but racing pigeons have exceeded 90. A duck hawk, sometimes thought of as one of our fastest birds, is

on foot, the record is doubtful. Their biological interest is in one bird's being able to overtake another, or the amount of energy expended. Their more general interest is that of any record—what is the biggest, the most costly, the strongest of its kind? When we think how carefully checked are human world records for the mile, for instance, we realize how poorly documented are fastest-bird records. But such as they are, the following often rejected records have been seriously put forward:

Indian spine-tail swift	200 m.p.h. (level flight)
Frigate bird	261 m.p.h. (level flight)
Duck hawk	360 m.p.h. (dive)
Golden eagle	570 m.p.h. (dive)

The fastest records of level flight in calm air that were accepted by Meinertzhagen in 1955 are: homing pigeon, 94.3 miles per hour; golden plover, 62; hummingbird, 60; mallard, 60; swift, 57.

FRUSTRATION IN FISH

In a valley in Mexico, in the state of San Luis Potosi, there are several caves with pools containing blind and half-blind fish well known to aquarists as *cave tetras*. These are closely related to and, indeed, may be crossed with normal-eyed river fish but this presents some difficulties as has been reported by Dr. C. M. Breder, Jr., Curator of Fishes and Aquatic Biology at the American Museum of Natural History, New York.

The normal-eyed fish are gregarious and usually rest in compact schools kept together by visual perception. The blind fish do not form schools but wander continually at random. When a blind and an eyed fish are placed together in a tank for experimental purposes the eyed fish attempts to follow the blind one in its aimless wandering. This is very often disastrous for one or the other. The eyed fish may become emaciated and die, Dr. Breder says, since blind fish normally eat much more than eyed fish and apparently are adjusted to the continual exercise. The eyed fish may become erratic in behavior. One actually took to spinning on its snout at one end of the tank but recovered after removal to another tank. Most likely the eyed fish will attack the blind one and destroy it.

Dual-purpose Skirts

Batak women of the Philippine Islands wear bark skirts wide enough to wrap twice around their bodies so that their skirts can serve as blankets at night if necessary.

How mosquitoes carry malaria is illustrated by an exhibit in Albert W. Harris Hall (Hall 18).

SCIENCE BAFFLER: HOW MANY ANIMALS ARE THERE?

By G. ALAN SOLEM

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MANY TIMES I have been asked the seemingly simple question, "How many animals are there?" This has always embarrassed me since no quick answer is possible. What are "animals"? Does "how many" mean individuals or kinds? If kinds, does this mean kinds known to scientists, kinds actually living today, or should the many extinct animals be included? Viewed in this light, the question becomes very complex.

WHAT IS AN ANIMAL?

If one considers only the higher plants and animals, it is relatively easy to propose definitions which will separate the two categories.

at this time. The term "animal" does include far more than mammals and other vertebrates. Biologists use it to cover the vast and heterogeneous assemblage called invertebrates as well as the more familiar vertebrates. A sponge is as much an animal to a biologist as is a mammal, although in the popular literature this definition might not be utilized.

A coral and a clam are two kinds of animals, but by "kind" one usually means "species." Biologists know what a species is, more or less certainly, just as they know what an "animal" or a "plant" is, but definitions are very difficult to make. A good working definition might read: "A species is a kind of animal, composed of all populations of individuals, which, under natural condi-



ARTHROPODA—IN NUMBERS, THE DOMINANT GROUP OF ANIMALS

About 864,000 species of insects and their relatives are known, making this phylum by far the largest of any animal group. Photograph shows section of "Animal Kingdom" exhibit devoted to these creatures.

When the single-celled and subcellular organisms are examined, it becomes obvious that there is no dividing line between "animal" and "plant," but that there is *one world* of living things. The question of how to define animals and where to place the things which are neither animal nor plant is a separate subject and will not be discussed

tions, is actually or potentially capable of interbreeding and producing fully fertile offspring." Species are then grouped into higher categories on the basis of supposed relationship. No general agreement on the number and composition of the many higher categories exists and even on the question of the phyla, the largest divisions formally rec-



Rand, Austin Loomer. 1958. "Speed of Birds." *Bulletin* 29(2), 4–5.

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