

*Phoenicurus auroreus auroreus*. A female Daurian Redstart was collected by pheasant hunters on March 30, in the vicinity of Kumhae, just north of Pusan. The ovary was enlarging, the follicles distinct.

*Luscinia akahige*. This record of the Japanese Robin is apparently the first for Korea. A single bird was flushed from a dense cluster of rose bushes along a small stream east of Pusan on April 11, 1952. Two were found in the same place on April 18, and a female was collected. These birds flushed very reluctantly and flew only short distances at a time, but they were very difficult to see since they stayed close to the ground in the depths of the thicket almost entirely. The female remained nearly motionless and invisible for fully five minutes, against a background of brown leaves on the ground but otherwise quite in the open, before I caught a slight movement of her head. These birds were probably stragglers. The ovary of the bird collected was small ( $6 \times 4$  mm.).

*Regulus regulus japonensis*. A male Golden-crowned Kinglet was collected at dusk on April 1, 1952, in a pine woods east of Pusan.

*Emberiza elegans elegans*. A male Yellow-throated Bunting was taken on January 1, 1952, near Kumsong from a small flock of tits and buntings in the brush along a stream.—RICHARD M. STRAW, Rancho Santa Anita Botanic Garden, California, August 12, 1952.

**Erythrocyte Permeability and Bird Relationships.**—Recently attention has been given to the delineation of animal relationships by using techniques derived from physiology and biochemistry. Prominent among investigators engaged in this work are Boyd and Boyden and Irwin (serology), McCabe and Deutsch (protein electrophoresis), and Jacobs and his co-workers (hemolysis). The latter (see, for example, Jacobs, Glassman, and Parpart, Jour. Exp. Zool., 113, 1950:277-300) have shown that the permeability of vertebrate red blood cells to certain penetrating solutes is similar within a vertebrate class and distinct between classes. Thus a bird's erythrocytes have permeability relations characteristic generally of the class Aves and differing distinctly from those of mammals, reptiles, amphibians, and fishes.

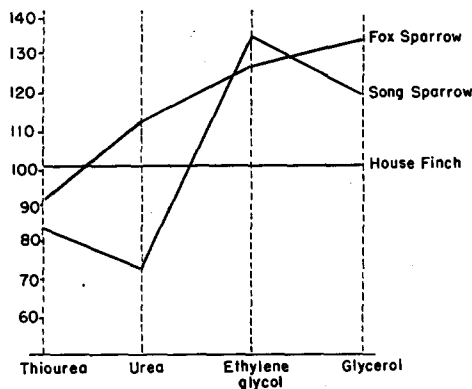


Fig. 1. Times of hemolysis of erythrocytes of House Finch shown as 100 per cent; times for Fox Sparrow and Song Sparrow shown as percentages of values for House Finch.

A current hemolytic theory holds that the configuration of the molecules on a cell surface will be partly reflected in the behavior of penetrating solutes at the cell surface. This surface configuration is sufficiently complex that only a portion of it will enter into the permeability relationships with any given substance. This accounts for the differences in time of permeability of various substances regardless of their shape or molecular weight. It is only to be expected that species which are considered close relatives on conventional grounds will be as "closely related" at the cellular level, and that they will reflect this in similar times of hemolysis for a particular solute. This report outlines a study made

to determine something of the usefulness of red cell permeability in avian taxonomy at the generic and specific levels.

The techniques used were those outlined in the paper by Jacobs, Glassman, and Parpart (*loc. cit.*). The penetrating solutions used were 0.3M thiourea, urea, glycerol, and ethylene glycol, all at pH 7.3. The time necessary for 75 per cent hemolysis in these solutions was determined by the use of a Coleman spectrophotometer and was measured by an electric timer.

Blood was taken from House Finches (*Carpodacus mexicanus*), Fox Sparrows (*Passerella iliaca*), and Song Sparrows (*Melospiza melodia*). The choice of species was partly one of convenience, as all were abundant in central California in January, 1952, when the study was made. An equally important reason for the choice is that by contemporary systematics the House Finch is placed in a different subfamily of the Fringillidae than are the sparrows; the latter are close enough that they are considered by some to be congeners (Linsdale, Univ. Calif. Publ. Zool., 30, 1928:367-368).

An inspection of the relationships displayed in figure 1 shows that even for only four solutes the sparrows have more affinities to each other than have they to the House Finch. Doubtless the use of a greater variety of solutes would show this affinity more precisely.

Times of hemolysis for the House Finch were: thiourea, 98-99.4 seconds (2 trials); urea, 118-138, mean 130 (3); glycerol 2.7-3.5, 3.0 (3); ethylene glycol, 3.7-4, 3.9 (2). For the Fox Sparrow: thiourea, 81-100, 91 (4); urea, 132-150, 149 (4); glycerol, 3.5-4.3, 3.9 (4); ethylene glycol, 5.1-5.6, 5.5 (4). For the Song Sparrow: thiourea, 81-87.7, 84.3 (2); urea, 75.4-103, 91.2 (4); glycerol, 3.7-5.0 4.1 (3); ethylene glycol, 3.6-5.7, 4.9 (5).

It would seem then that the potential worth of hemolysis in taxonomy at the level of genus and species in birds has been indicated; the need for additional investigations, however, is clear.—RICHARD F. JOHNSTON and BENJAMIN HOCHMAN, *Museum of Vertebrate Zoology and Department of Zoology, University of California, Berkeley, California, August 21, 1952.*

**Rufous Hummingbird Nesting in California.**—Since the summer of 1949 the writer has been sure that the Rufous Hummingbird (*Selasphorus rufus*) nested in the interior portion of the Trinity Mountains in northern California. In May of 1952, a female with nest and eggs were collected in extreme northeastern Humboldt County, California. Dr. Robert T. Orr of the California Academy of Sciences checked on the identification, and using the width of the outer rectrices, pronounced the bird *Selasphorus rufus*. The skin is now deposited in the collection of the California Academy of Sciences and the nest and eggs are in the Talmadge Collection. This is the first definite record of the nesting of this species in California.

The history of the search dates back into the ornithology of Humboldt County. For years, the older collectors that resided in the county believed the Rufous Hummingbird was nesting somewhere in the area. They based their assumption on the fact that although the Allen Hummingbird (*Selasphorus sasin*) was the common nesting species, many Rufous were seen during the breeding season. Nests and females were closely watched all over the region. The only unusual find were two nests of the Anna Hummingbird (*Calypte anna*) along the Mad River at Blue Lakes, in May, 1940, and on May 31, 1946.

In the early summer of 1949 the writer took up residence on the Trinity River. Judging by back coloration males of both Allen and Rufous hummingbirds were along the river. Field trips into the higher mountains east of the Trinity River revealed only the red-backed males. No specimens were taken as the peak of the normal nesting season had passed.

In late June of 1950 a field trip was taken to Trinity Summit, and a nest with large young was located. The female was observed closely and the two outer rectrices appeared to be very wide. No specimens were taken but the nesting site was marked.

In 1951 a more intensive search was carried on at the higher elevations, with the same result. Another nest was located with young and marked. As in previous years, the nesting birds along the Trinity River proved to be the Allen, with the "red-backs" restricted to the mountains east of the river.

The late winter of 1952 was rather severe in the Trinity Mountains, but late in the spring a short field trip was made to snow line. It was found that many of the higher basins with either a southern or southwestern exposure were almost clear of snow. A search was made at the site of the nest that was found in 1950. On May 4, 1952, a nest with two fresh eggs with the incubating female was col-