

United States Fish and Wildlife Service record refers to the date by the phrase "dispatch of October 24, 1963." The record was taken from the official newspaper Red Star of Soviet Union dated 25 October 1963.

Possibly more of the Pintails that use California wintering grounds frequent the Asiatic land mass for breeding than we have assumed in the past.—CHARLES F. YOCOM, *Wildlife Management, Division of Natural Resources, Humboldt State College, Arcata, California, 5 May 1966.*

Hemoglobins of a Ring-necked Pheasant × Jungle Fowl Hybrid.—The use of protein molecules as a source of taxonomic information is well established in theory, and in recent years considerable effort has been expended in the study of avian molecular systematics. This has produced significant information on the inter- and intraspecific variations of selected proteins (Sibley, *Ibis*, 102:215, 1960; Lush, *Genet. Res.*, 5:257–268; 1964). However, there are no data available on intraspecific geographic variation in avian proteins and little information available on the proteins of hybrid birds. The description by Manwell *et al.* (*Comp. Biochem. Physiol.*, 10:103, 1963) of the electrophoretic behavior and oxygen equilibrium curves of the hemoglobin from a Japanese Quail (*Coturnix coturnix*) × Jungle Fowl (*Gallus gallus*) hybrid and the work of Hilgert and Vojtiskova (*Folia Biol. (Praha)*, 5:317, 1959) on the alkaline denaturation of hemoglobin from a Guinea Fowl (*Numida numida*) × Domestic Fowl hybrid appear to be the only studies on avian hybrid hemoglobins available.

The properties of avian hemoglobins as taxonomic characters have been explored electrophoretically at the level of the whole molecule, chemically at the level of total amino acid content and amino acid content of selected tryptic peptides (Saha, *Biochim. Biophys. Acta*, 93:573, 1964), and at the level of physiological attributes such as oxygen equilibrium curves (Ghosh, *Comp. Biochem. Physiol.*, 16:341, 1965). This paper is a report on an investigation of the genetic variability of the hemoglobins in several strains of the Domestic Fowl and the hemoglobins from a Ring-necked Pheasant (*Phasianus colchicus*) × Jungle Fowl hybrid.

Blood from mutant strains in six breeds of Domestic Fowl and from the Jungle Fowl and pheasant parents and F₁ hybrids was obtained through the cooperation of Ralph Somes, Department of Poultry Science, University of Connecticut.

Blood was collected by heart puncture in heparin-coated syringes. Hemoglobin solutions were prepared according to the methods of Manwell *et al.* (*loc. cit.*). Electrophoresis was carried out in vertical starch gel in a discontinuous Tris-citrate:borate-LiOH buffer system (Ashton and Bradon, *Aust. J. Biol. Sci.*, 14:248, 1961) and in cellulose acetate on the Beckman Microzone Apparatus in both continuous (barbital and phosphate) and discontinuous (see Graham and Grunbaum, *Amer. J. Clin. Path.*, 392:567, 1963) buffer systems. The pH of the various buffers ranged from 8.2–8.6 and the best results in acetate were obtained in the continuous barbital system (pH = 8.6, $\Gamma/2 = 0.05$), and the discontinuous Tris system. Separations were carried out at 250 v for 60–90 minutes in cellulose acetate and at 250 v for 8 hours in starch gel.

Total proteins were detected in starch gel by staining with Amido Black and in cellulose acetate by staining with Ponceau Red-TCA. Hemoglobins were stained selectively with dianisidine.

Gallinaceous birds have a multiple hemoglobin system which appears to consist of two fractions. The minor component, in alkaline pH, always moved anodally relative to the major fraction. No differences were apparent which related to the various techniques employed. This study indicates that there are no detectable differences in the mobilities of the hemoglobin fractions in the mutant strains of the Domestic Fowl, no differences between the Domestic Fowl and the Jungle Fowl and no difference among the Jungle Fowl, Ring-necked Pheasant, and their hybrid.

Previous morphological and biochemical studies on the Phasianinae have suggested an extreme homogeneity. The results of this study do not differ in this conclusion. However, the pheasant × Jungle Fowl cross failed to produce a third hemoglobin component as was reported for the Coturnix × Jungle Fowl cross by Manwell *et al.* (*op. cit.*) The causes and significance of this difference are currently under investigation.

This investigation was supported, in part, by a grant from the University of Connecticut Research Foundation.—ALAN H. BRUSH, *Department of Zoology, The University of Connecticut, Storrs, Connecticut, 28 April 1966.*