

The specimen was identified by R. Johnson of the Zoology Department, Washington State University and was donated to the Charles Conner Museum at Washington State University (Catalogue No. 80-233).

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## BREEDING RECORD FOR THE SNOWY PLOVER FOR MONTANA

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While working in the Canyon Ferry Wildlife Management Area near Townsend, Broadwater Co., Montana on 24 June 1975, I observed a Snowy Plover (*Charadrius alexandrinus*) on a gravel shoreline. The bird was near a 240-ha artificial pond. Construction of the pond in 1974 created extensive mud and gravel flats, which have attracted a variety of shorebirds. I collected the bird, which blended exceedingly well with the gravel background; it was not until I approached the specimen that I discovered I had shot two birds. When the skins were prepared, examination of the gonads suggested that the birds had been breeding. The fe-

male had a shelled egg in the oviduct and the male's testes measured 6 mm in length. The two specimens (Montana State University Vertebrate Collection 5970 and 5973) are the only Montana specimen records. The nearest breeding range (A.O.U. Check-List of North American Birds, Am. Ornithol. Union, Baltimore, 1957) is in Utah, 450-500 miles south of the Canyon Ferry location. The only other documented record of a Snowy Plover in Montana was an individual seen from 24-28 April 1975 on a gravel flat at Ft. Peck Reservoir (Carlson, *Am. Birds* 29:868-869, 1975). A photograph of the bird appeared in *American Birds* (29:997, 1975).

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## OCCURRENCE OF TWIN GADWALL EMBRYOS

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Twin embryos have been reported in eggs of several bird species. Berger (1953) noted twinning in the American Goldfinch (*Carduelis tristis*) and the Song Sparrow (*Melospiza melodia*). Romanoff and Romanoff

(1972) found twinning as common in birds as it is in other animals. They noted that twins can form from eggs with double yolks, eggs with one yolk and two blastoderms, and eggs with one yolk and one blastoderm.

Chilling Mallard (*Anas platyrhynchos*) eggs to 0° and 4°C for five to 10 days (Batt et al. 1975) and inducing hypothermia in White Leghorn Chickens (*Gallus gallus*; Sturkie 1946) increased the incidence of twins. These methods affected embryonic development after the eggs had been deposited and in the hen before laying. Sarvella (1975) suggested that cleavage may be stimulated by various types of stress.

A part of our waterfowl field research involves the attachment of a tag to the web of wild Gadwall (*Anas*

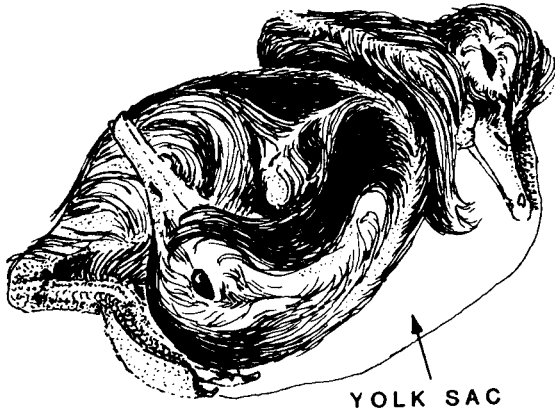


FIGURE 1. The position of the twin Gadwall embryos within the egg.

*strepera*) embryos during the pipping stage (Alliston 1975). On 28 June 1979, one egg of a clutch of 12 being marked was found to contain two live embryos. This is the only incidence of twinning we have seen in some 300 Gadwall eggs.

The egg with the twin embryos weighed 47.0 g. The other eggs in the clutch varied in weight from 31.0 g to 35.0 g and averaged 33.0 g. The twin embryo egg was 14.0 g (45%) heavier than the average. The mean weight of 119 Gadwall eggs at pipping stage in 1979 was 38.9 g and only one egg exceeded the weight of the twin embryo egg.

Eggs lose weight during incubation, thus the egg with the twins was much heavier than the rest of the clutch when laid. It probably contained two blastoderms and what appeared to be one large yolk or possibly two intimately associated yolks. The occurrence of two blastoderms within the single egg was probably not caused by low temperatures. Temperatures in the general locale did not fall below freezing during laying

or the week previous to laying (U.S. National Oceanic and Atmospheric Administration 1979). Twinning was probably caused by a physiological stress other than cold temperature that affected this yearling hen prior to laying.

The two embryos were positioned in the egg with the abdomens touching and the heads at opposite ends of the egg (Fig. 1). Both embryos were females. Both were perfectly formed and alive when initially observed but died soon after being collected. Neither of the twins had broken the egg shell, and it is questionable if they would have had sufficient strength to hatch and leave the nest.

We appreciate the sketch of the twin embryos so aptly accomplished by Allison Banks and the review of the paper by George A. Swanson and Bruce D. J. Batt.

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## RECENT PUBLICATIONS

**A Guide to Bird Finding West of the Mississippi. Second edition.**—Olin Sewall Pettingill, Jr. 1981. Oxford University Press, New York. 783 p. \$25.00. Pettingill's major innovation in ornithology is probably his idea—now much copied—of a guidebook about where to look for birds. The present volume is a thoroughly updated version of his western guide (originally published in 1953), a counterpart to the already-revised eastern guide (noted in *Condor* 79:286). "In this second edition, most chapter introductions are retained virtually unchanged except for corrections, updating, and otherwise slight alterations. But all bird-finding sites are either new, or, if repeated from the first edition, have been revised in accordance with changes in bird distribution during the past quarter-century, modifications of the natural environment by human creations and activities, and highway construction." The chapter introductions each give an admirable overview of the environment and birdlife of their state, especially good for birders who cannot visit the specific sites that are described. The book is illustrated with 60 pen-and-ink drawings by George M. Sutton, many of them new in this edition. The index is useful for identifying places where a desired species may be sought.

**Naturalist's Color Guide. Part III.**—Frank B. Smithe. 1981. American Museum of Natural History, New York. 10 color cards and 37-page paperbound booklet, \$8.00. Complete set, \$17.50. Source: Publications Dept., A.M.N.H., Central Park West at 79th Street, New York, NY 10024. This is a supplement to a reference work for identifying and describing colors (noted in *Condor* 77:372). The color cards (which are punched to fit the looseleaf binder of Part I) more than double the number of colors; the booklet tells how these colors were selected and measured. Now complete, the system should be even more workable for those who need to refer to colors in nature.

**Avian Endocrinology.**—Edited by August Epple and Milton H. Stetson. 1980. Academic Press, New York. 577 p. \$34.00. The 27 articles in this book treat the structure and function of avian endocrine organs and the roles of hormonal mechanisms. Based on papers that were given at a 1980 symposium and published soon afterward, they provide a comprehensive and concise evaluation of current knowledge in this field. No introduction or summary is offered and no discussion by the participants is included. The volume is fittingly dedicated to Donald S. Farner. Illustrations, references, index.