of the molt was not evaluated other than to identify the presence of basic I and alternate plumage.

A post-mortem examination was not conducted on the molting bird, so I can only speculate as to the cause and identity of the apparently abnormal molt. Two alternatives seem plausible. (1) The hen was undergoing a delayed prealternate molt; the delay resulting from physiological stress due to (a) overwintering in a harsh environment, (b) heavy parasite infestation, or (c) disease. All three factors may influence the timing of the molt in waterfowl (Billard and Humphrey 1972). (2) The molt was a premature prebasic II molt induced by physiological stress resulting from a, b, or c above. As the hen retained much of the basic I plumage, I suggest that the abnormal molt was a delayed prealternate molt, thus conforming to the complete mid-winter molt hypothesis. The bird's poor physical condition and, subsequently, the delay in its presumed prealternate molt could have been induced by one or several of the factors listed by Billard and Humphrey (1972). Ruddy Ducks overwintering at Farmington Bay W.M.A. (winter densities normally low, 0–50 birds) face a relatively harsh winter climate and a scarcity of food due to the lack of open water (Joyner 1969). This alone could have caused the observed low body weight of the hen and, in turn, may have delayed the prealternate molt. Ruddy Duck drakes overwintering at Farmington Bay W.M.A. in 1967–68 retained the basic plumage through mid-March. Spring migrants arriving at Farmington Bay W.M.A. in mid-March were found to be in the nuptial or alternate plumage (Joyner 1969:33).

Four of the Ruddy Duck hens collected retained some basic I plumage (identified as yearling females in Table 1) as described by Palmer (1976: 505–506) and were identifiable as yearlings by plumage alone. Three of the 4 hens retained a bursal remnant and occluding membrane. We considered the remaining 15 hens to be in alternate plumage. They lacked both a bursal remnant and occluding membrane, and could not be aged. Of the 15 hens, 5 showed an incomplete tail molt.

The verification of a complete mid-winter molt in the Ruddy Duck will obviously have to be based on authenticated sightings and/or collection of flightless Ruddy Ducks on their wintering grounds. My earlier sightings (November 1967, February 1968) lend support to the complete mid-winter molt hypothesis, whereas this sighting clouds an already opaque issue.

Financial support was provided through research grants from the Frank M. Chapman Memorial Fund of the American Museum of Natural History, the Society of Sigma Xi, and the Josselyn Van Tyne Memorial Fund of the American Ornithologists' Union. I thank E. Bailey, V. Thomas, and A. L. A. Middleton for critically reviewing the manuscript.

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Condor, 80:103–104

POSSIBLE INFLUENCE OF FOOD ON EGG-LAYING AND CLUTCH SIZE IN THE BLACK-BILLED CUCKOO

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Nolan and Thompson (1975) discussed the apparent proximal influence of food supply on clutch size and timing of breeding in the Yellow-billed (*Coccyzus americanus*) and Black-billed (*C. erythropthalmus*) cuckoos. Observations I made in 1976 on nesting Black-billed Cuckoos on the forested ridge which separates Lake Manitoba and the Delta Marsh, Manitoba, provide additional evidence for such control.

On 5 June 1976 I found two Black-billed Cuckoo nests, both containing five eggs. Nest I was 1.7 m above the ground in the crotch of a bent Manitoba maple (*Acer negundo*). Nest II was 3.2 m up on a horizontal branch of a Manitoba maple. On 8 June, nest I contained three young and two eggs, but by 12 June the fourth young and an unhatched egg were on the ground. Nest II had fallen to the ground by 11 June. Considering the incubation period of 10–11 days in this species (Spencer 1943), these clutches probably were started on 20 May or even earlier. The large clutches and their early initiation coincided with an infestation of the forest tent caterpillar (*Malacosoma disstria* Hbn.) on the ridge. The larvae were first detected in insect sampling of tree foliage on 13 May 1976, were abundant by 17 May, peaked by 6 June, and had pupated by 6 July (see Busby 1978). Hence, they had been available as food and as a possible stimulus to Black-billed Cuckoo nesting since mid-May.

Black-billed Cuckoos consume forest tent cater-

pillars (Bent 1940, Fashingbauer et al. 1957). Between 26 May and 14 June 1976, I observed nine adult cuckoos taking 17 large tent caterpillars at different locations on the ridge. During two hours of observation on 11–12 June from a blind near nest I, an adult ate 29 caterpillars and seven dragonflies and fed 11 tent caterpillars to the young. Cuckoos become more numerous during local outbreaks of caterpillars (Forbush 1927, Bent 1940, Nolan and Thompson 1975). Hamilton and Orians (1965) proposed that the Yellow-billed Cuckoo's local variation in density is attributable to a relatively nomadic post-migratory phase during which local food resources are appraised and settlement patterns regulated. High numbers of Black-billed Cuckoos have been reported in areas of Saskatchewan during outbreaks of the forest tent caterpillar (Belcher 1961, Stewart 1961, Roy 1964).

Twenty-five cuckoos were mist-netted and banded on my study area between 30 May and 20 August 1976, 23 of these in a 400 m stretch of the ridge. Only two cuckoos were netted in 1975, both in August, with a netting time nearly equal to that of 1976. However, a different type of net (untethered) with slightly larger (36 mm) mesh size was used in 1976. Tethered nets of 30 mm (used primarily for capturing small passerines) were used in 1975 and were not efficient in capturing and holding cuckoo-sized birds. More cuckoos were present in 1975 than the netting indicated.

I compared sizes and initiation dates of the 1976 clutches with Black-billed Cuckoo nesting data from central Canada, contained in the Prairie Nest Record Scheme (PNRS) (Manitoba Museum of Man and Nature). Clutch sizes were determined from nests that were visited by the observer at least twice and where the number of eggs remained the same. The average size of 17 such clutches, located prior to 1976 in areas outside the Delta Beach Ridge, was 2.7 eggs (1 of 1 egg, 8 of 2, 5 of 3, 2 of 4, 1 of 5). On the ridge in 1975, J. P. Goossen found a nest containing 1 egg and 1 young on 23 June; a third egg, probably laid by another female (see Nolan and Thompson 1975), appeared on 27 June. On 20 June 1975, I found a nest containing 2 eggs, but by 23 June they had been destroyed.

In 1976, two other nests outside the area of caterpillar infestation contained 3 eggs each. One was found on 12 July by M. Collins north of Glenboro, Manitoba. The second was found near Lyleton, Manitoba, by R. W. Knapton and contained 3 eggs by 30 June and 3 young by 6 July. The first clutch probably was started about 1 July and the second about 15 June.

I determined the approximate dates of clutch initiation for 16 Black-billed Cuckoo nests between 1958 and 1975 (in PNRS). The mean was 22 June (range = 6 June to 1 August). The two found on the ridge in 1976 were initiated about 2 weeks earlier than 6 June.

Two nests, with 4- and 5-egg clutches, found by K. D. Paton near Oxbow, Saskatchewan, were begun about 15 and 20 June 1963, respectively. A 4-egg clutch found by D. Hjertaas in 1971 near Wauchope, Saskatchewan, was initiated about 22 June. There is an early record (Shortt and Waller 1937) of a 5-egg clutch found on 24 July 1936 by S. Waller near Gypsumville, in Manitoba's interlake region. The clutch sizes of the Saskatchewan nests possibly were influenced by tent caterpillars in 1963 and 1971, as widespread infestation occurred throughout east-central Saskatchewan during those years (V. Hildahl, pers. comm.). Although tent caterpillars probably were present near Gypsumville in 1936 (Hildahl and Reeks 1960, V. Hildahl, pers. comm.), the nesting occurred after the larvae would have pupated (see Hildahl and Campbell 1975).

It appears that the two large clutches I found on the Delta Beach Ridge in 1976 were laid in response to the availability of forest tent caterpillars. Black-billed Cuckoo clutches found there during the absence of caterpillars and outside the area of infestation in 1976 were smaller and started later.

My work on avian breeding ecology and habitat use was funded by grants from the National Research Council of Canada (A9556) and the University of Manitoba Research Board. D. G. Busby provided useful information concerning the seasonal abundance of insects on the ridge. H. W. R. Copland provided the information on cuckoo nestings contained in the Prairie Nest Record Scheme. This paper is contribution number 36 of the University of Manitoba Field Station (Delta Marsh).

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