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Adoption of Chicks Among Thick-billed Murres

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Thick-billed Murres (*Uria lomvia*) breed in dense aggregations on cliff ledges. Like Common Murres (*U. aalge*), they build no nests, the single egg being laid on bare rock. Breeding murres of both species rarely leave their egg or chick unattended, but they may do so in the event of attacks by predators, in response to disturbances (e.g. nearby rockfalls; Gaston and Nettleship 1981), under conditions of extreme food stress (Birkhead and Nettleship 1984), or occasionally in response to severe attacks by mosquitos, or heat stress (A.J.G. pers. obs.). During periods of desertion, eggs may roll away from the site and chicks may run up to several meters from the site in order to seek shelter in crevices, or to avoid predators. However, parents recognize their own egg by its color and markings (Tschanz 1959, Gaston et al. 1993), and their chick by its call (Tschanz 1959). The chicks also are capable of recognizing the calls of their parents and actively seek to return to them once they return to the site.

When their own egg is lost, murres sometimes incubate the egg of another bird, either appropriating one left unattended, or even stealing one from under an incubating neighbor. Chicks hatched from such appropriated eggs are reared in normal fashion. When foreign eggs have rolled from adjacent sites, birds may attempt to incubate more than one egg, but in such cases no more than one hatches (Gaston et al. 1993).

Tschanz (1959, 1979) and Birkhead and Nettleship (1984) observed Common Murres protecting foreign chicks that were temporarily deserted by their parents during a period of food shortage. Wanless and Harris (1985) reported two cases where neighbors helped to rear chicks that also were fed by their own parents. None of these observations involved complete fostering. However, Perry (1940) described an apparent adoption of a neighbor's chick by a Common Murre pair. In this note, we describe four cases in which Thick-billed Murre chicks were adopted and reared by foster parents. Three cases involved natural events, while the fourth involved a chick displaced during banding activities.

All observations were made at Coats Island, Northwest Territories, Canada in 1993 and 1994. Observations were made daily in both years throughout the

chick-rearing period. Methods used were the same as those described by Gaston et al. (1993). Our observations caused no disturbance to breeding birds, so they cannot account for the three apparently natural adoptions.

Case 1.—A five-day-old chick was present at site D154 on 25 July 1993, but was missing on 26 July, when a chick of similar age was being brooded by a bird at site D54, about 1.5 m directly below D154. The pair at D54 already had a chick that was one to four days old at that time. The ledge that they occupied supported two other pairs, one of which was incubating an egg that was eventually deserted after it failed to hatch within the normal incubation period. The other was occupied by a pair that was never known to have laid an egg. Both members of the pair at D54 were banded as breeders at the same site in 1986 and had definitely bred at the site annually since 1988. They brooded both chicks continuously throughout the rearing period, one chick usually being under a wing and the other under the breast. Fighting between the chicks was not observed. The pair at D154, also both uniquely banded, remained at their site and made no further breeding efforts. They were never seen to land anywhere except at their own site. Feeding was observed at D54 twice, but we did not see which chick was fed. The plumage development of both chicks was normal.

The larger chick (presumably the older, adopted chick) departed from the site at 2023 EST on 14 August, making a successful glide to the sea. Both foster parents were present when it left, but neither interacted with it as it prepared to depart, or accompanied it (for descriptions of adult and chick behavior at departure, see Tschanz 1959, Gaston and Nettleship 1981). Unless it was adopted at sea (some observations suggest that this may occur; G. Gilchrist unpubl. data), the chick would have perished because chicks are fed by the male parent for at least a month after leaving the colony (Scott 1990). The smaller chick left at 2153 the next night, accompanied by both parents, although, as is normal in Thick-billed Murres (Gaston and Nettleship 1981), the female returned to the breeding site within 10 min and continued to occupy it for several days thereafter.

Case 2.—At site P23, the egg disappeared on 25 July

1993 after four days of incubation. On 2 August a small chick was present at the site and a one- to two-day-old chick was missing from site P28, about 1 m directly above it. None of the nine other sites on the P23 ledge changed their status at that time. Of P23's immediate neighbors, one pair had never laid, as far as we know, and the other was incubating an egg. The chick exhibited normal plumage development and, at 21 days, was old enough to depart when observations ceased. None of the parents involved was banded.

Case 3.—At site Q19, an egg was laid on 20 July 1993 and lost on 22 July. On 1 August a chick appeared on the site after banding operations had caused some disruption in the area. Two sites, both about 0.7 m above Q19, lost chicks, one six days old and the other nine days old. Judging from the appearance of the chick, it was probably the younger of the two, from site Q11, where one member of the pair was banded. At the other site from which the chick could have originated, both members of the pair were banded. One member of the pair at Q19 was banded, and this bird (eight years old) continued to occupy the site after the arrival of the chick. We observed it brooding the chick daily and feeding the chick on at least eight occasions, while an unbanded bird, presumably its mate, also fed and brooded the chick regularly. None of the potential biological parents paid any attention to the chick, or landed anywhere other than their own site. The chick departed on the night of 15/16 August. The departure was not seen, but the male foster parent (banded) was not seen again after the chick had left; the observations parallel the normal situation, where a chick departs successfully, accompanied by the male parent (Harris and Birkhead 1985).

Case 4.—Two chicks hatched at adjacent sites on 25 July 1994, but both were brooded and fed by the same pair, Q48. The birds at the adjacent site (Q64) were seen to bring fish twice, with the normal greetings ceremony performed on both occasions. Neither fish was fed to the chicks, which made no obvious response to the arrival. Both chicks looked small for their age, although plumage developed normally. One disappeared 15 days after hatching, when a dead chick, almost certainly the same one, appeared on the ledge below. The other chick departed at 24 days old. Apparently, both were fed exclusively by the Q48 pair.

Additional case.—One other case of adoption was observed: a two-day-old chick fell from its natal site and was brooded and fed by another pair with a chick of the same age. However, in this instance one of the chicks disappeared after five days. The chicks were brooded together by the parent under the same wing and were seen fighting a great deal. It is possible that antagonism between them caused the death of one. We also noted two cases in which chicks were habitually brooded by a neighbor that also had its own chick, even while their parent was present. No antagonism was seen between the pairs of chicks. In the

one case where we observed several feedings, each pair fed only their own chick. At these two sites the male of one pair and the female of the other had bred on the sites concerned continuously since 1986 and, hence, were very familiar with one another. Similar alloparenting behavior was reported for Common Murres by Birkhead and Nettleship (1984).

Discussion.—Our observations indicate that Thick-billed Murres are capable of adopting and rearing foreign chicks under natural conditions. The three adoptions in 1993, where the fostered chick was reared to departure age, were detected among 316 sites subject to daily observations where a chick was known to have hatched. Adoptions could have gone undetected where an egg was lost close to hatching and a chick adopted immediately, but it is unlikely that more than one or two such events could have gone unnoticed. Other, less complete observations in earlier years suggested that the number of adoptions we observed in 1993 and 1994 was not unusual and that adoption may be a regular feature of the Coats Island colony. Combined with the previous observations of egg stealing, our results confirm that we can expect a few percent of Thick-billed Murre pairs to be rearing chicks that are not directly related to them.

The incidence of fostering may vary with the type of breeding site. All four ledges from which chicks fell were less than 0.3 m wide. Chick age at adoption may be a factor in their acceptance. In this study, all chicks involved were less than 10 days old at adoption. In one case, the adopting pair had a similar-aged chick of their own, while in the other cases birds had lost eggs earlier in the season and the dates of adoption were outside of the laying period.

Tschanz (1959) observed Common Murre parents searching actively for lost chicks and conducting them to their natal site. In contrast, the original parents in our study took no interest in their chicks after they had fallen from the site, despite being within hearing range of the chick's call. However, we were not watching during the displacement of the chicks and parental concern may already have been exhausted by the time of our first observations, up to 24 h after the event.

Kin selection may be involved in the apparent readiness of Common Murres to protect the chicks of neighboring birds (Birkhead and Nettleship 1984). Such an explanation also would apply to fostering behavior of Thick-billed Murres if birds breeding in the same part of the colony are more closely related than the average for the entire colony, as has been suggested by Birkhead et al. (1980) and by Gaston and Nettleship (1981).

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Reinterpretation of the Probable Parentage of a Hybrid Wood-warbler (*Seiurus* × *Dendroica*)

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An immature male wood-warbler netted north of Ocean City, Maryland, on 17 September 1965 was described by Short and Robbins (1967), and identified by them as "an apparent hybrid Northern Waterthrush (*Seiurus noveboracensis*) × Blackpoll Warbler (*Dendroica striata*)."¹ I have examined this specimen (U.S. National Museum no. 481595) and agree that one of the parents was undoubtedly a Northern Waterthrush. However, I believe that the characters displayed by the hybrid agree more with a hypothesis of parentage by a Cape May Warbler (*Dendroica tigrina*) rather than a Blackpoll Warbler.

Short and Robbins (1967) briefly considered two species of *Dendroica* other than *D. striata* as possible parents of the hybrid, namely the Palm Warbler (*D. palmarum*) and Cape May Warbler. They stated that the hybrid "resembles an immature Cape May Warbler in breast streaking and breast color, but the hybrid's larger size, differently shaped bill, lack of neck markings, and absence of any indication of a yellow rump patch seem to rule out that species as one of the parents." I see no reason to invoke the size of the hybrid as an indication of the *Dendroica* parentage; although the Blackpoll Warbler is indeed larger than the Cape May Warbler, there is no reason not to attribute the large size of the hybrid to the waterthrush

parent. I would consider the bill shape of an intergeneric hybrid to be unpredictable, as nothing is known about the heritability of bill characters. As for the rump patch, there is no assurance that any such character would necessarily be inherited in a hybrid and, in fact, in many Cape May Warblers in first basic plumage the rump patch is not yellow, but a yellow-green only slightly brighter than the back color.

In all plumages, Cape May Warblers have at least a hint of a yellow or yellowish area just posterior to the ear coverts (well illustrated in plate 6 of Curson et al. 1994). This is presumably the area of the bird to which Short and Robbins (1967) referred in stating that the hybrid lacked "neck markings," but in fact there is a distinct yellowish area at the sides of the neck in the hybrid specimen, contrary to the statement by Short and Robbins. I regard this as one of the arguments in favor of the *Dendroica* parent having been *D. tigrina*.

Other characters favoring *D. tigrina* over *D. striata* are as follows. The upper tail coverts have vague but obvious dark centers, positioned like the black feather centers of *D. tigrina*, but absent or rare in *D. striata*. The crown markings resemble those of *D. tigrina*; again, these are rare in *D. striata*. The vague marks on the back resemble the broader black marks of *D. tigrina*