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PLUMAGE VARIATION IN YOUNG RAZORBILLS AND MURRES

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Variation in the head, chin, and throat plumage of young Thick-billed Murres (*Uria lomvia*) and Razorbills (*Alca torda*) has been reported by Gaston and Nettleship (1981) and Hudson (1984), respectively. These authors found that young, just prior to leaving the colony, were of one of two plumage types, having: (1) a dark head, cheeks, chin, and throat, referred to as "summer" plumage because it resembles the adult summer plumage, or (2) white cheeks, chin, and throat, similar to the adult winter plumage and referred to as "winter" plumage. We present data on the occurrence of this and other plumage variation among Razorbills, Common Murres (*U. aalge*), and Thick-billed Murres.

METHODS

Data on all Razorbills and Common Murres, and some for Thick-billed Murres were obtained from the Gannet Clusters (53°56′N, 56°32′W), Labrador in 1983. Data for Thick-billed Murres were also obtained from colonies at Coburg Island (75°48′N, 79°29′W) in 1979; Cape Hay, Bylot Island (73°45′N, 80°23′W) in 1979; and East Digges Island, Hudson Strait (62°34′N, 77°45′W) in 1981.

Data on the plumages of young Razorbills were obtained during visits to breeding sites made every second day to obtain weight and wing length; additional data came from chicks caught as they left the colony. We examined the plumage of Common Murre chicks by catching them as they left the colony, or by observing undisturbed chicks on breeding ledges at distances of 15–30 m using a 25× telescope. Most of these chicks were on study plots examined regularly (Type 1 procedure; described in Birkhead and Nettleship 1980) and were of known age. The plumage of Thick-billed Murre chicks was examined in the same way at Cape Hay, but not at Coburg Island (see Birkhead and Nettleship 1981) and Digges Island where data were obtained from chicks which died accidentally as they left the colony.

We divided chicks into 3 categories, "summer," "winter," and "intermediate." Among Razorbills "intermediate" was similar to the "summer" type, but with some white feathers on the chin and throat. The "summer" and "winter" plumages of Razorbills are shown in Fig. 1. We noted another aspect of plumage variation in young Razorbills. In the alternate (but not basic) plumage of adult Razorbills, a white line runs from the anterior of the eye to the base of the upper mandible on each side of the head. In some chicks this feature was distinct, while in others the white lines were absent. We scored this white line as: 0 (absent), 1 (trace), 2 (poorly-defined or incomplete), and 3 (well-defined)

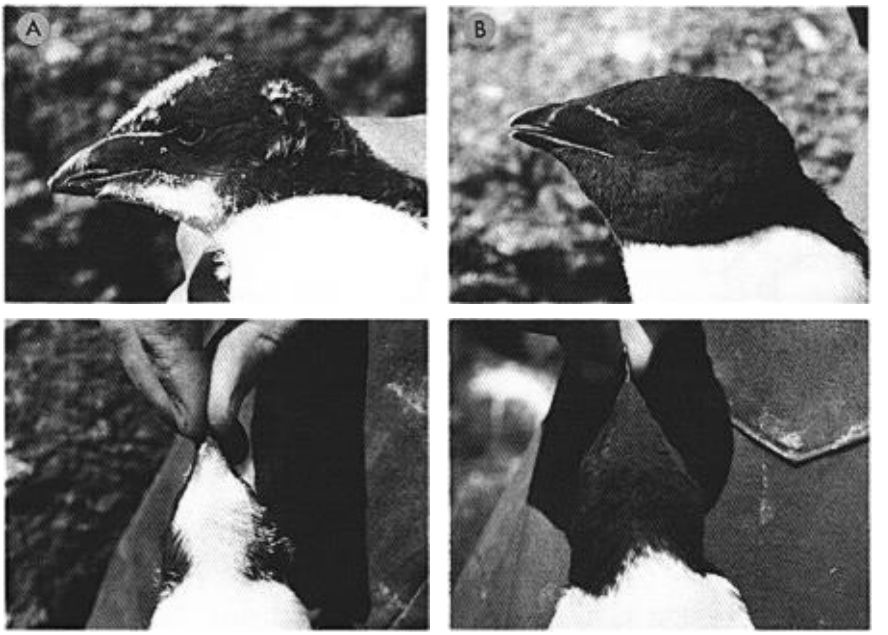

FIGURE 1. Plumage variation in Razorbill chicks. The upper and lower photographs show the same chicks viewed from the side and below. The chick A is "winter," and chick B is "summer," from the Gannet Clusters, August 1983. Note also the difference in the development of the white line: chick A is category 3 (full white line), while chick B is category 2 (see text, and Fig. 2).

(Figs. 1 and 2). There was no change in the white-line score as chicks got older. Although the presence or absence of a white line is also a summer-winter plumage difference, both of the "winter" chicks which we examined had well-defined white lines (Fig. 1). This indicates that summer and winter types of both plumage characteristics can occur on the same chick.

RESULTS

Razorbill.—Of 134 chicks examined, 128 (95.5%) were classed as "summer," 4 (3.0%) as "intermediate," and 2 (1.5%) as "winter." At Skomer Island, Wales, Hudson (1984) found that 49% of 51 chicks were in "summer" plumage and 51% in "winter" plumage, significantly different from our results ($\chi^2 = 68.5$, 1 df, $P < .001$).

Approximately equal proportions of Razorbill chicks were assigned to each of the white-line categories, and these proportions did not differ among different islands at the Gannet Clusters ($\chi^2 = 5.53$, 13 df NS). There were no statistical differences in hatching dates or fledging weights among chicks with "summer," "intermediate," or "winter" plumage,

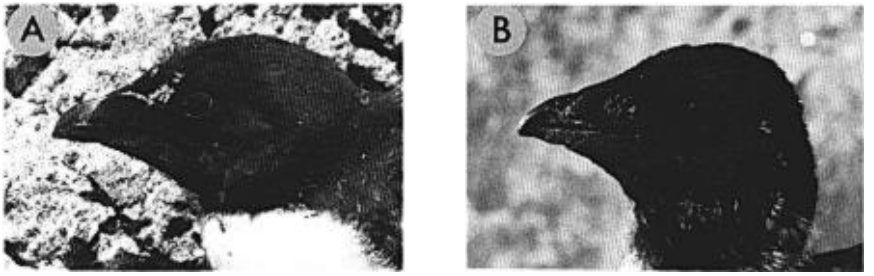

FIGURE 2. Variation in the development of the white line in Razorbill chicks at the Gannet Clusters, August 1983. Chick A is category 3 (full white line), chick B is category 0 (no white line).

or among the 4 white-line categories. P. J. Hudson (pers. comm.) also noted variation in the distinctiveness of the white line among Razorbill chicks at Skomer Island, but did not quantify it.

Common Murre.—Before considering the plumage variation among Common Murre chicks, we will outline the differences in plumage which exist between the young of the two murre species. These were most pronounced among chicks 1–5 days old and those old enough to leave the colony (16–25 days). The dorsal down of young Thick-billed Murre chicks varied through silver gray, to brown, to dark charcoal gray, in most cases with brown brindling on the longer down. In contrast, that down on young Common Murre chicks was usually medium gray with no trace of brown brindling. They also retain more down feathers on their head—at least until they leave the colony, than Thick-billed Murre chicks (Fig. 3). Unlike Thick-billed Murres, Common Murre chicks aged 14+ days have a dark gray "mask," white throat, cheeks, and line running up behind the eye. This line also distinguishes adult Common

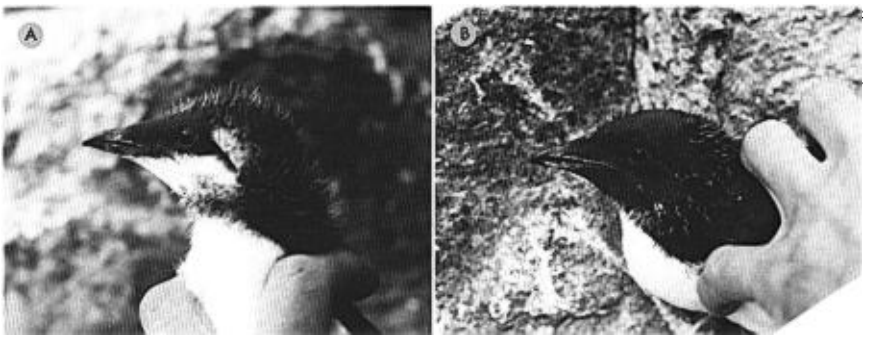

FIGURE 3. Differences in the head and throat plumage of a typical Common Murre chick (A) and a summer-plumage Thick-billed Murre chick (B). Both chicks were photographed the day prior to fledging at the Gannet Clusters, Labrador, in August 1983.

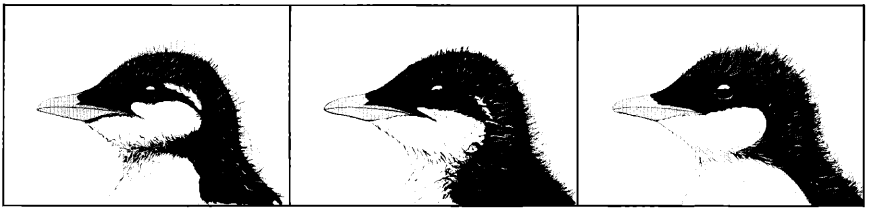

FIGURE 4. Variation in the head and neck plumage of Common Murre chicks aged 21–25 days. Drawn from photographs of chicks caught as they left the Gannet Clusters colony, Labrador, August 1983. A, the most frequent type, note dark collar and white behind the eye; B & C are two rare types—B, note reduced collar and white area behind the eye, and C, note lack of white behind the eye.

Murres from adult Thick-billed Murres when in the basic (i.e., winter) plumage (Salomonsen 1944). Variation in the head and throat plumage of Common Murre chicks affects only the amount of white on the cheeks and behind the eye (Fig. 4). It is less striking than the summer/winter types found in the Razorbill and Thick-billed Murre (see below), and therefore we did not attempt to quantify it.

Thick-billed Murre.—Of 94 Thick-billed Murre chicks at Gannet Clusters that were classified according to plumage type, 64% were "summer," 25% "intermediate," and 11% "winter." The proportion of these 3 plumage types respectively was similar at all colonies: Digges Island—59%, 24%, and 18% (n = 22); Coburg Island—70%, 20%, and 10% (n = 69); Cape Hay—64%, 27%, and 9% (n = 58), ($\chi^2 = 2.6$, 6 df NS).

We recorded weight and wing length of chicks as they left the colony at Coburg Island and Cape Hay (Birkhead and Nettleship 1981), but there were no statistical differences in these parameters for chicks of different plumage types at the two colonies. Similarly, Gaston and Nettleship (1981) found no differences in any growth parameters or hatching dates for "summer" or "winter" chicks at Prince Leopold Island.

Our results suggest that geographic variation in the summer-winter plumage types among Thick-billed Murre chicks in eastern Canada is rather small. In contrast, the differences in the proportion of these plumage types among Razorbills from Labrador and Skomer Island, Wales, is striking. Further surveys will show whether any geographical pattern to this variation exists. The bridled-normal plumage polymorphism in (adult) Common Murres shows a clear geographic pattern (Southern 1938). Variation in the plumage of the young of other alcid species has been reported (e.g., Wehle 1982), but any functional significance has yet to be demonstrated.

SUMMARY

Variation in the head and throat plumage of young Razorbills and Common and Thick-billed murres is described. The proportions of 3 plumage types among Thick-billed Murre chicks at 4 colonies in eastern

Canada did not differ. The proportion of these same plumage types among Razorbills, however, differed markedly between Labrador and Wales.

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