Migration of Juvenile Thick-billed Murres through Hudson Strait in 1980

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Aerial surveys carried out in September 1980 suggested that, after leaving the large colonies at Digges Sound (62°35′N, 77°40′W), Thick-billed Murre *Uria lomvia* chicks, each with a parent, dispersed slowly during the first 1-2 weeks, but then migrated through Hudson Strait at a rate in excess of 40 km/day^{-1}, passing the eastern entrance to the Strait within a month of leaving the colony.

Key Words: Thick-billed Murre *Uria lomvia*, migration, Hudson Strait.

Banding carried out by the late L.M. Tuck in 1955 showed that Thick-billed Murres (*Uria lomvia*) from the large colonies at Digges Sound (62°35′N, 77°40′W), at the western end of Hudson Strait, winter off Newfoundland. Young birds leave the colony in August and begin to be recovered in substantial numbers off Newfoundland in October, so the southward movement takes about two months (Gaston 1980). Young Thick-billed Murres leave their colonies while still incapable of sustained flight, at about one-fifth of adult weight, and they probably remain flightless for at least six weeks (Tuck 1961).

To document the timing and speed of migration of the young murres and their parents after leaving Digges Sound, we flew a series of partly overlapping aerial surveys over Hudson Strait in September 1980 using a DeHavilland Twin Otter aircraft equipped with a GNS 500 navigation system. Surveys were flown at 175-220 km.h^{-1} (mainly 180-200 km.h^{-1}) and 45 m above the sea. Two (or three) observers were used: one in the co-pilot's seat and the other in the second seat behind the pilot; the third observer, when present, was in the second seat behind the co-pilot. All data presented derive from the first two observers who were the same for all surveys (the author and D. Noble). Sightings of murres and all other birds were recorded on a tape recorder by two-minute periods, so that positions were known within 5.8-7.3 km. Sightings estimated within 200 m of the line of flight were recorded as "on transect". (For further details of methods see Nettleship and Gaston 1978). Surveys were flown on five days and covered 4 112 km (Table 1, Figure 1). Transects parallel to coastlines were flown at 1 km from the shore, cutting across narrow bays and inlets. Where offshore transects started or ended at the coast, the first and/or last 2-minute periods were combined with coastal transects for analysis.

Results and Discussion

Substantial numbers of Thick-billed Murres, including many chicks, were seen on all surveys except 9 September. Most chicks were accompanied by a single adult; less commonly groups of several adults and chicks were encountered. Densities were higher on offshore transects than on coastal transects, except very close to the Digges Sound colonies (Table 1). On 3 and 4 September most chicks and adults were concentrated in an area within 140 km north and east of Digges Sound, well offshore (Figure 2). An extrapolation of observed densities south of Nottingham and Salisbury Islands on transects 5, 23, and 24 on 3 September (mean 3.71 chicks. km^{-2}) to the entire area "A" (11 000 km^2, enclosed by the broken line, Figure 2) suggested that approximately 40 000 chicks were present. By 9 September few chicks were seen in West Hudson Strait, but on 13 September a dense concentration was present in a band about 30 km wide along the south coast of the Meta Incognita Peninsula to the east of Lake Harbour (Figure 3). Extrapolation of densities for area B (4 000 km^2, mean density 2.9 chicks. km^{-2}) suggests that c. 12 000 were present. A concentration along this coast was still apparent on 19 September, when surveys were extended further to the east.

Chicks began to leave the breeding sites at Digges Sound on 10 August and three-quarters of the chicks on the colony had left by 25 August. The total size of the population is approximately 300 000 pairs and in 1980 about 64% of 205 pairs studied reared a chick, so about 190 000 chicks altogether left the colony (unpublished data). Mortality immediately after fledging is probably heavy and this, combined with the tendency of aerial surveys to severely underestimate numbers of birds on the sea (Stott and Olson 1972, Nettleship and Gaston 1978), suggests that the

TABLE 1. Transects and distances flown and numbers of Thick-billed Murres recorded within 200 m of the line of flight, during 5 surveys in September 1980.

Date	Transects	Distance Flown	Murres Observed		Density of Adult-chick pairs/km²
			Unaccompanied Adults	Adult-chick pairs	
3 Sept. coastal	1,4,6,7,22	362	336	36	0.25
offshore	2,3,5,23,24	538	718	319	1.48
4 Sept. coastal	11	115	8	0	0
offshore	25,27,28	363	188	60	0.41
9 Sept. coastal	8,9,10,19	339	0	0	0
offshore	20,21,24,25,26,27	766	34	16	0.05
13 Sept. coastal	12,18	139	12	5	0.09
offshore	13,29,30,31,32	632	236	123	0.49
19 Sept. coastal	16,17	255	4	0	0
offshore	14,15,32,33,34,35	603	81	43	0.18

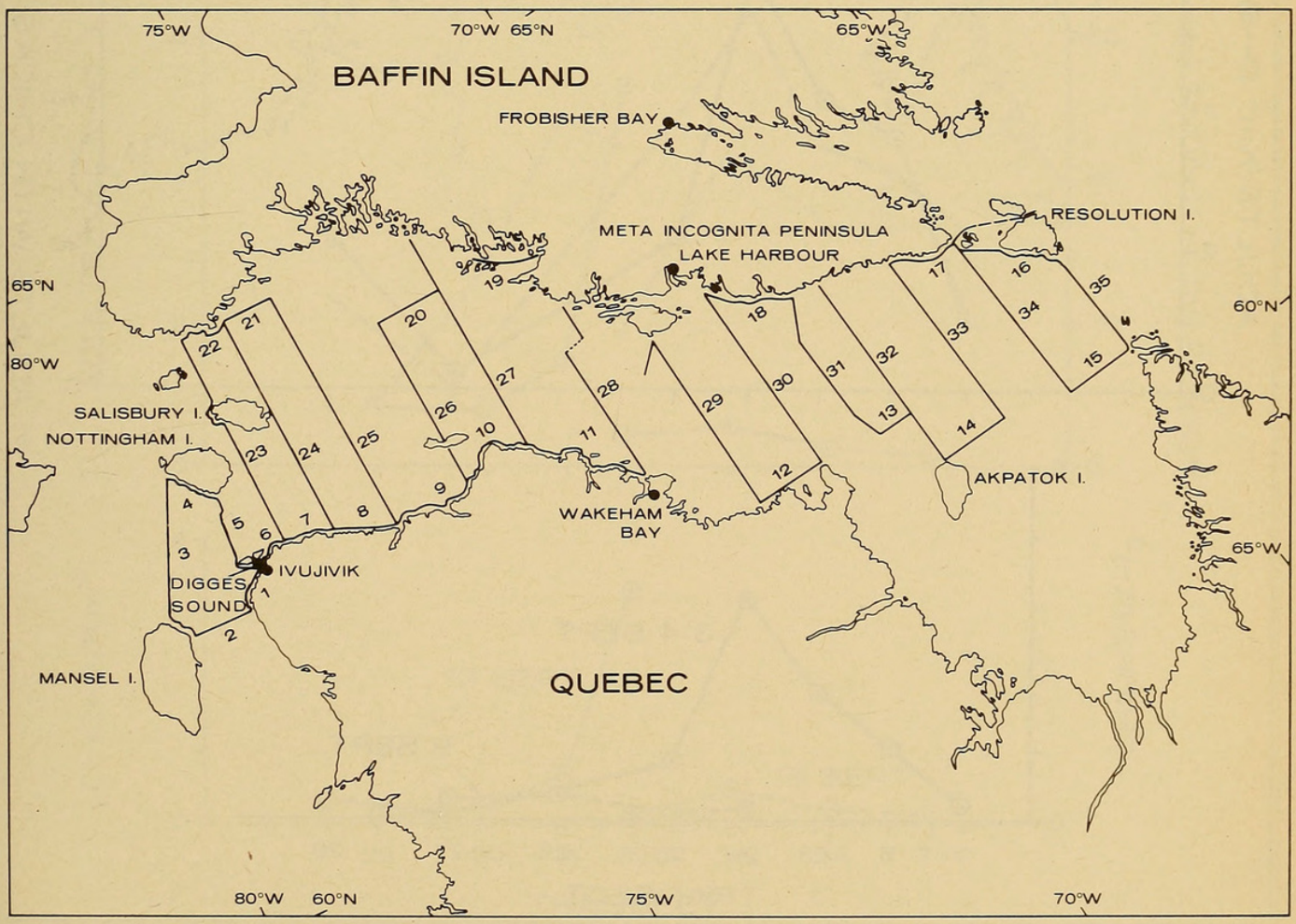

FIGURE 1. Map of aerial surveys conducted over Hudson Strait in September 1980.

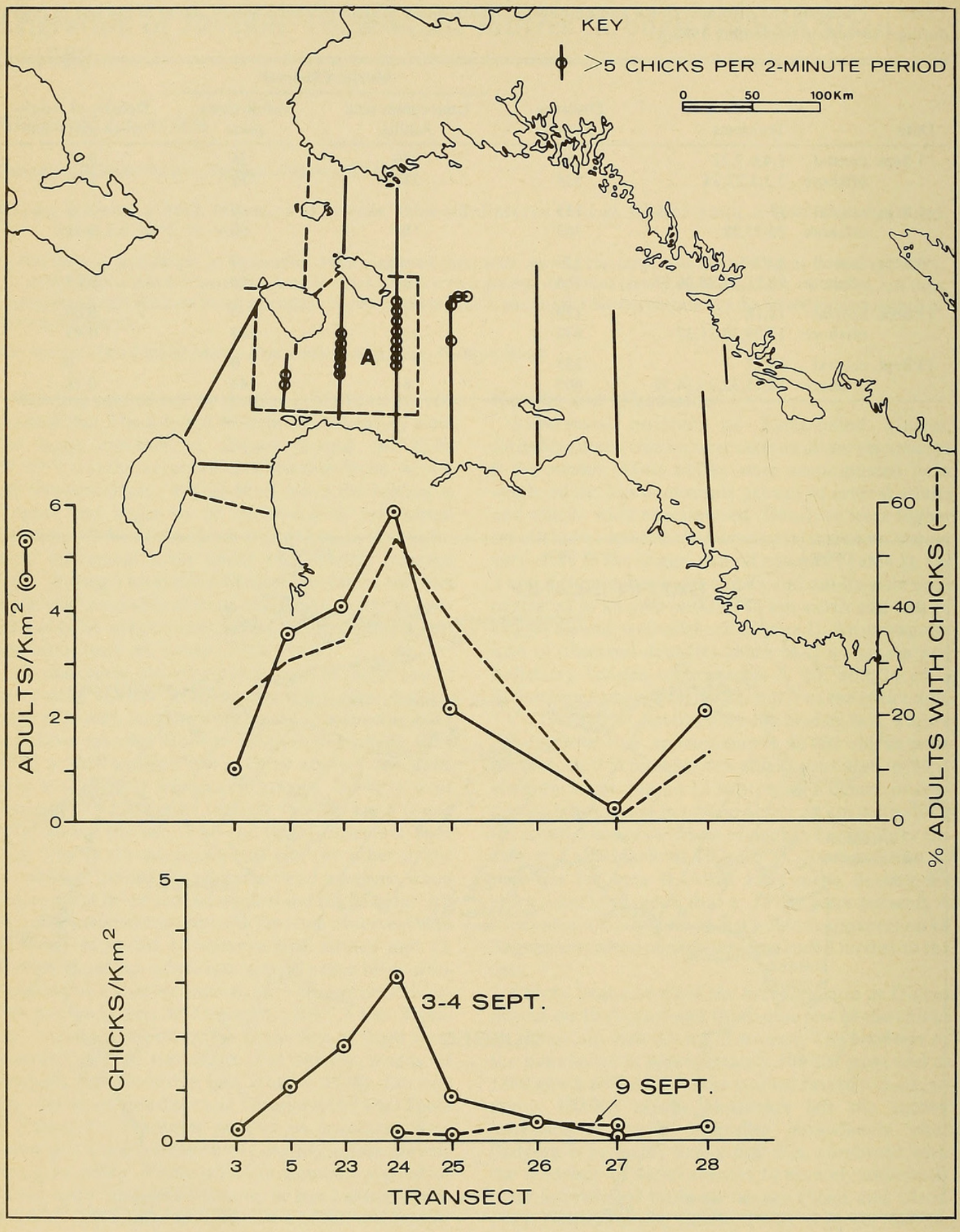

FIGURE 2. Concentrations of Thick-billed Murres observed on transects flown on 3, 4 and 9 September 1980. Upper graph applies to 3 and 4 September only.

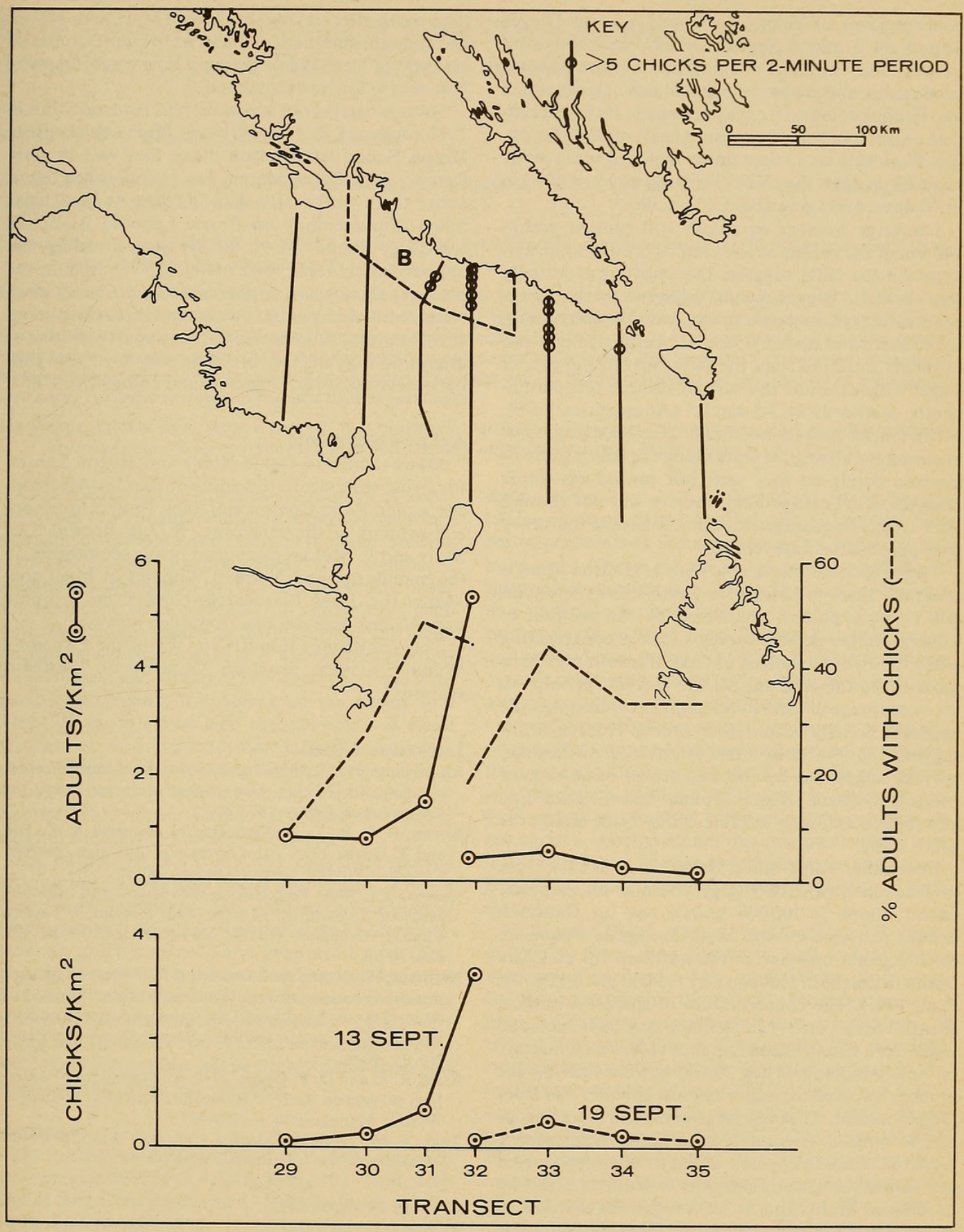

FIGURE 3. Concentrations of Thick-billed Murres observed on transects flown on 13 and 19 September 1980. Left half of upper figure applies to 13 September, right half to 19 September.

concentration of chicks north and east of Digges Sound on 3 and 4 September may have involved between one-third and one-half of the entire season's production, and probably included some chicks which had fledged at least 10 days previously. If the concentration observed along the south coast of Meta Incognita Peninsula on 13 September included some of the same birds, then the chicks involved covered 400 km in 10 days, averaging about 40 km.day^{-1}.

The large number of chicks still present within 140 km of the colony at least ten days after some had departed the cliffs suggests that movement initially was slow. In Digges Sound adjacent to the murre colony, tidal currents are strong, with the ebb, setting to the north and east at 3-5 km.h^{-1}, being stronger and of longer duration than the flow. Just to the east of Cape Wolstenholme the current inshore sets permanently eastwards at 3-5 km.h^{-1} (Anonymous 1979). Most chicks moved northeast after fledging, thus avoiding the strong currents along the south shore of Hudson Strait, so they were not carried eastwards immediately. Perhaps adult murres will not commit their chicks to passage through the Straits until they have spent some time feeding.

The direction of surface currents in Hudson Strait is generally westward along the north shore (Anonymous 1979), a pattern confirmed by the position of icebergs on the present surveys. Chicks congregating along the coast to the east of Lake Harbour may have moved into the area against the current, perhaps to take advantage of local opportunities for feeding. The apparent scarcity of murres in central Hudson Strait suggests that that area offers relatively poor feeding, an idea supported by the absence of large seabird colonies between Digges Sound and Ungava Bay although seemingly suitable cliffs exist along the south shore.

Four other Thick-billed Murre colonies exist close to Hudson Strait; two large colonies on Akpatok Island, (both > 100 000 pairs), one on Hantzsch Island, just east of the Meta Incognita Peninsula (50 000 pairs) and one at the northern tip of Coats Island in northern Hudson Bay (15 000 pairs) (Brown et al. 1975). The concentration of chicks in western Hudson Strait on 3-4 September may have included some from Coats Island, whence chicks also migrate to Newfoundland (Tuck 1961), but considering the number involved the majority must have derived from Digges Sound. That chicks seen off the Meta Incognita Peninsula originated from either Hantzsch or Akpatok Islands appears unlikely. Surveys carried out across the eastern entrance of Hudson Strait by MacLaren Marex Inc. in 1978 suggested that chicks from Akpatok Island moved directly eastwards rather than north after leaving the colony (MacLaren Marex Inc., unpublished data). Chicks from Hantzsch Island also would have had to detour a long way from their best course for Newfoundland.

Surveys carried out across eastern Hudson Strait in 1978 suggested that Thick-billed Murre chicks from Digges Sound left Hudson Strait that year in early October (MacLaren Marex, Inc., unpublished data), about three weeks later than in 1980. At the Thick-billed Murre colony on Prince Leopold Island, in Lancaster Sound (74° N, 90° W) also, breeding was approximately three weeks later in 1978 than in the previous three years, a phenomenon probably associated with abnormally low temperatures (Nettleship et al., in prep.). Comparison of the apparent timing of migration suggests that breeding may have been similarly delayed at the Digges Sound colony in 1978.

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