Another probable hybrid of *Larus marinus* and *L. argentatus*.—On 5 December 1970 Arthur R. Clark and I collected a gull on the Niagara River off the Sir Adam Beck Generating Station 2.5 km upstream from Queenston, Ontario, Canada. Based on its intermediate characters between the hypothesized parents, we believe that it is a hybrid between the Great Black-backed Gull (*Larus marinus*) and the Herring Gull (*L. argentatus*). It is similar to a female gull (AMNH 707766) J. R. Jehl, Jr., secured in 1959 on Staten Island, New York, which he concluded is probably a hybrid of these species (Auk, 77: 343, 1960).

The Niagara gull was first seen at the generating station on 22 November by Clark and several other birders. It was noted again on 3 and 4 December among the many Herring Gulls feeding in the outflows from the station. This individual habitually stood with Herring Gulls on the railing at the edge of the station. It usually looked down at the outrushing water and occasionally descended to the surface for fish. It invariably dominated the other gulls for space on the railing.

This gull is an adult female (BSNS 6437) in winter plumage, moderately fat, ovary 18 × 8 mm, weight 1318.3 g. Head, neck, underparts, and tail are white; the crown, nape, sides of head and neck, and upper breast have heavy, dark-brown streaks. The mantle most closely corresponds to the Neutral Gray of Ridgway (Color standards and color nomenclature, Washington, D. C., published by the author, 1912). The 10th (outermost) primary has a subterminal pale gray and white spot 53 mm long extending completely across both vanes, and the 9th has a 21-mm subterminal spot of the same colors across both vanes but not reaching the edges. Bill is yellowish-white tinged greenish, brighter yellow above and around an orange spot at the gonys. Iris is near Primrose Yellow tinged with olive and lightly flecked with brown. The eye-ring is a light but bright yellow and the legs and feet are whitish tinged flesh.

Measurements of this gull, those given by Dwight (Bull. Amer. Mus. Nat. Hist., 52: 182, 234, 1925) for *L. marinus* and *L. a. smithsonianus* and by Jehl for his probable hybrid, show that the Niagara specimen agrees fairly closely in size with the Staten Island bird and is intermediate between *argentatus* and *marinus* except in length of exposed culmen and tail (Table 1).

The mantle color of our gull is very slightly darker than that of Jehl's probable hybrid (too close to show in the figure), and is closer to that of *argentatus* than *marinus* (Figure 1). Jehl says that a point supporting his specimen's hybrid origin is that shape and color of its head streakings are identical to those of *marinus*. Our specimen's head streakings are similar to those on some specimens of *argentatus*, and we have an example of the latter whose head streakings resemble those on Jehl's bird. I suspect that this character may not be significant considering the possible variation in extent, density, shape, and coloration of gulls' winter head streakings. Jehl points out that colors of

TABLE 1

MEASUREMENTS (MM) OF FEMALE GULLS OF *L. MARINUS*, *L. A. SMITHSONIANUS*, AND THE TWO PROBABLE HYBRIDS

	L. marinus (7)	BSNS 6437	AMNH 707766	*L. a. smithsonianus* (16)
Wing (chord)	454–491 (465.8)	433	436	397–422 (410.6)
Tail	181–209 (189.4)	175	172	154–178 (165.3)
Tarsus	74–81 (75.7)	70	70	57–66 (62.1)
Exp. culmen	57–66 (60.7)	51.3	57	47–53 (50.1)
Bill (depth at base)	21–24 (22.3)	20.3	22	16–18 (17.0)
Bill (depth at gonys)	22–27 (24.0)	21.2	21.5	17–20 (18.0)

the eye-ring and the legs on his bird are probably not of great significance taxonomically as soft-part colors may vary seasonally in gulls. This would also apply to our specimen.

Our gull is unlike many examples of *marinus* as well as Jehl's bird in having its 10th primary with a subterminal spot instead of a long white tip. In this respect it agrees more closely with most *argentatus*, but its general primary coloration and pattern are otherwise similar to that of both species. Gull primary patterns are highly variable, and the patterns of the supposed parent species for these probable hybrids are often similar, so this character is not necessarily definitive of relationships. Comparison by Clark, E. Eisenmann, and R. D. Coggeshall of the Niagara gull with specimens of *L. argentatus*, *L. fuscus*, and *L. occidentalis* races and with *L. schistisagus* and *L. marinus* at the American Museum of Natural History showed that it differed in one or more characters from each of them. Its mantle is lighter than those of *fuscus* and *occidentalis* groups and *schistisagus*, and is darker than mantles of the *argentatus* group. The Niagara bird is also larger in most dimensions than Dwight's measurements for female specimens of the last four forms named.

There is, of course, no indication of the geographic origin of our specimen, but it is interesting to note that in only two parts of North America does a gull species with a darker mantle breed sympatrically with a species having a paler mantle than our bird's. These are *L. marinus* and *L. argentatus* in parts of northeastern North America, and *L. occidentalis* and *L. glaucescens* in a limited area on the Pacific coast. *L. marinus* has been reported to be increasing in numbers and expanding its range. If this continues, it will increase the probability of more hybridization involving this species.

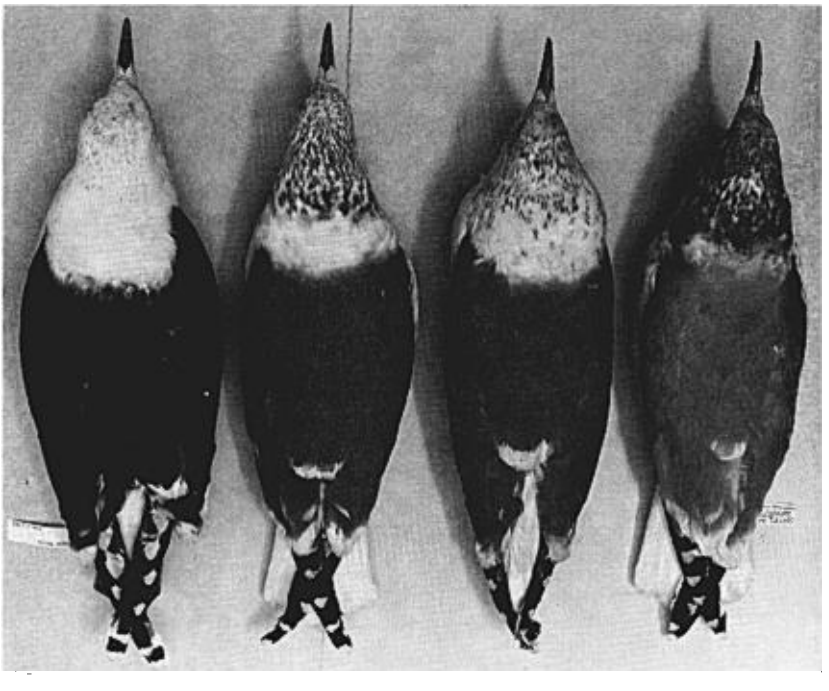

Figure 1. Left to right: *L. marinus*, BSNS 6437, AMNH 707766, *L. a. smithsonianus* showing intermediate mantle color of the two probable hybrids.

For permission to operate on Ontario Hydro property I thank H. A. Blomme, Plant Superintendent. I wish to thank Eugene Eisenmann for reading the manuscript and making helpful suggestions, and Dean Amadon for the loan of the gull specimen and permission to examine material in the American Museum collections.—ROBERT F. ANDRLE, *Buffalo Museum of Science, Humboldt Park, Buffalo, New York 14211.* Accepted 9 Aug. 71.

Ruffed Grouse primary molt chronology.[1]—The ecology and survivorship of male Ruffed Grouse (*Bonasa umbellus*) have been investigated at the Cloquet Forest Research Center, Cloquet, Minnesota since 1956. One of the most difficult aspects of working with Ruffed Grouse has been determining the time of death accurately. Gullion and Marshall (1968: 126) note the possibility of obtaining survival information from droppings and feathers left on or near the drumming log, but admit that the accuracy in determining the time at which any individual bird was lost from the population could be as vague as "during the summer." Male Ruffed Grouse manifest so high a degree of faithfulness in attendance to certain drumming logs (Gullion, 1967) that determining the molting sequence and the dates of primary loss would help in estimating the time of an individual's last visit to the site. Little is known about the loss sequence of adult Ruffed Grouse flight feathers, although the young have been studied in this respect (Bump et al., 1947; Davis, 1968).

The objective of this study was to determine the chronology of primary loss for free-living male Ruffed Grouse on the Cloquet study area. The study was initiated in July 1967 and terminated in September 1969. We wish to thank F. J. Svoboda, who contributed feather records, and W. H. Marshall, who critically read the manuscript. The cooperation of B. A. Brown and other personnel of the Cloquet Forest Research Center, School of Forestry, University of Minnesota, is greatly appreciated. The senior author was supported by a Minnesota Academy of Science Grant-in-Aid during the 1969 field season.

During the summers of 1967, 1968, and 1969, we made 819 weekly visits to active drumming logs and collected a total of 500 primaries, of which 276 were used in determining the shedding periods. We rejected those feathers impossible to identify because of rapid deterioration or rodent or other damage, and those picked up after a lapse of 5 or more days since the last visit to the log.

Most primaries could be identified by comparison with known primaries from male Ruffed Grouse. An identification key was developed, and the primaries were numbered from the innermost (P1) to the outermost (P10). The earliest recovered feather was a P1 found 8 June and the latest a P10 recovered 3 September. Numbers and dates of recovered primaries used were as follows: P1, 55, 8 June–30 June; P2, 62, 13 June–10 July; P3, 56, 16 June–11 July; P4, 41, 16 June–13 July; P5, 31, 19 June–17 July; P6, 8, 7 July–22 July; P7, 10, 17 July–7 August; P8, 2, 6 August–23 August; P9, 6, 6 August–2 September; P10, 5, 18 August–3 September.

These data confirm the findings of other workers for gallinaceous birds, that flight feather molt is not random but proceeds in a regular sequence (Taber, 1969), but Ruffed Grouse at Cloquet apparently lost P1 through P5 during the same time period (early June to mid-July). P1 was shed about 6 days earlier and P5 about 4 days later than P2, P3 and P4. It was common to find some combination of these five primaries at a drumming log during mid-June.

Recoveries of P1–P5 comprise about 89 percent of the feathers used for this analysis.

[1] Paper No. 7291, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul, Minnesota 55101.