# COMMON TERNS RAISE YOUNG FROM SUCCESSIVE BROODS[1]

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ABSTRACT.—In this paper I report the first instance of a pair of Common Terns (*Sterna hirundo*) raising young in successive clutches during one breeding season and discuss this phenomenon in relation to male and female incubation and feeding rates and to predation. Five other pairs are noted in which the female and sometimes the male incubated a second clutch while still feeding one young from their first nest. *Received 20 January 1983, accepted 1 November 1983.*

SUCCESSIVE clutches have been reported for two species of Laridae: Silver Gull (*Larus novaehollandiae*) by King (1913) and Nicholls (1964, 1974) and Common Black-headed Gull (*Larus ridibundus*) by Ytreberg (1956). The timings of successive clutches in these two species of gulls are quite different. King (1913) and Nicholls (1964) report double brooding in captive Silver Gulls in which pairs hatched young from clutches laid a little over 3 months apart. Nicholls (1974) reported that, of 50 marked pairs of Silver Gulls in a wild population, 33 pairs double brooded. The initial egg of first and second clutches might be laid between 13 and 20 weeks apart. Ytreberg (1956) reports a shorter period, 5-7 weeks, as the time between first eggs of successive clutches for the Common Black-headed Gulls he observed in Norway.

In this paper I report the first instance of a pair of Common Terns (*Sterna hirundo*) raising young from successive clutches in one breeding season. The timing of successive clutches was similar to that reported by Ytreberg (1956) for Common Black-headed Gulls. In addition, I report on five other pairs in which one or both members of a pair incubated a second clutch while still feeding young from their first brood. There are no previous records in the literature of successive clutches in Sterninae; in this issue of *The Auk*, however, Wiggins et al. (1984) also report this phenomenon in Common Terns from colonies in Ontario, Canada and Massachusetts and Rhode Island in the United States.

[1] I dedicate this paper to Dr. Dean Amadon, both for his encouragement and help when we started working on Great Gull Island and later for his continued support of the project.

## STUDY AREA AND METHODS

Great Gull Island lies at the eastern end of Long Island Sound (41°12'N, 72°07'W) and is the site of a long-term study of a colony of Common Terns (Cooper et al. 1970, Hays and Risebrough 1972, DiCostanzo 1980). The data included in this paper were collected on Great Gull Island during 1978, 1979, and 1980. In each of these years, between 2,200 and 2,700 pairs of Common Terns nested on the island. Throughout each season a team checked the island daily, marking and recording newly laid eggs and later banding newly hatched chicks. I have taken the laying and hatching dates for the eggs and chicks mentioned in this paper from these records.

Renest has traditionally been used in the literature to describe situations where a pair nests again following the loss or destruction of eggs or young. In this paper I will use the term recycle in referring to the process or period in which a pair produces a second clutch of eggs while still feeding one young from their first brood.

We know from our records of renesting pairs on Great Gull Island that, if the young from the first clutch of eggs disappear at any of a variety of ages, the female may be sitting on a new clutch of eggs 9 days after we noted the loss of eggs or chicks. On the basis of these data, I have assumed that 9 days is the minimum amount of time required for a pair to recycle and for the female to lay an egg after a clutch of eggs or young have been lost.

All adult Common Terns mentioned in this paper wore unique, four-band combinations composed of three colored plastic bands and an aluminum U.S. Fish and Wildlife Service band. This made it possible to identify them with certainty as they fed young from their first nest and incubated their second clutch.

Observing from permanent observation towers overlooking concentrations of nests, we found six pairs of terns in 1979 and 1980 incubating second clutches while still feeding a young from their first brood. The pairs with successive clutches are numbered 1-6 and are listed in Table 1. I will refer to a pair's first nest as Nest A and the successive clutch as Nest B.

In both years we used a Bausch and Lomb Zoom 20-60× spotting scope to observe the adults and read their color codes. To document the behavior of pairs incubating a second clutch while still feeding young from their first brood, I set up a continuous watch at one nest in 1979 and one in 1980. Participants took 2-h shifts throughout the day, during which they noted (1) which bird incubated, brooded, or just stayed in the nest area and (2) the number of fish that were brought by which individual, whenever it was possible to identify the individual. In 1979 we watched a nest 8 m from an observation tower on 14 days (6-20 July); watches averaged 9.5 h/day, ranging from 6.9 to 11.5 h. In 1980 the nest that we watched on 35 days (7 July-14 August) was about 25 m from an observation tower; watches averaged 11.4 h/day with a range of 9.7 to 12.5 h. In 1979 14 persons participated and in 1980 26 persons helped with the watch.

TABLE 1. Pairs of Common Terns laying successive clutches on Great Gull Island, New York.

| Pair | Band number | Banded | Age[a] | Sex |
|---|---|---|---|---|
| 1 (1979) | 832-56565 | 1974 | AHY | ♂ |
| | 842-35986 | 1974 | AHY | ♀ |
| 2 (1979) | 842-35939 | 1969 | AHY | ♂ |
| | 832-56573 | 1967 | AHY | ♀ |
| 3 (1980) | 832-56653 | 1976 | AHY | ♂ |
| | 822-97109 | 1966 | HY | ♀ |
| 4 (1980) | 862-21320 | 1976 | AHY | ♂ |
| | 862-21336 | 1977 | AHY | ♀ |
| 5 (1980) | 842-50597 | 1974 | HY | ♂ |
| | 822-86117 | 1975 | AHY | ♀ |
| 6 (1980) | 822-96766 | 1970 | HY | ♂ |
| | 832-57743 | 1973 | HY | ♀ |

[a] AHY = after hatching year (adult); HY = hatching year (flying young).

## RESULTS

The first hint that Common Terns might lay successive clutches was suggested by the following observation. On 29 June 1978 I saw a pair of banded Common Terns copulate while their 20-day-old young stood nearby. The following day I found an egg on the spot where the female of the pair had been sitting following copulation, but no bird incubated it.

In 1979 and 1980 we found a total of six pairs (Table 1) where one or both members of the pair incubated a second clutch of eggs while feeding young from the first brood. The interval between the time of deposit of the first egg in successive nests for the six pairs ranged from 37 to 54 days. The interval for Nests 1 and 4 are approximate, as the eggs in Nest B for Pair 1 and those in Nest A for Pair 4 were not marked within 24 h of the time they were laid. In all cases the second clutch was laid on the same site as the first nest, and each of the six pairs was raising a single chick from the A nest at the time that the first egg of the B nest was laid. Only Pair 3 successfully fledged young from each of its successive nests. Table 2 is a summary of the egg and chick data for Nests A and B of these six pairs.

For Pairs 1-4 the chicks in Nest A hatched 1-3 days apart. We marked the first egg of Nest B for Pairs 2-4 from 9 to 13 days after we recorded the death or disappearance of a chick or egg from the A nest, which reduced the brood size of A to one. Pair 5's single egg in their A nest hatched 17 June, and 13 days later we marked the single egg of their B nest on 30 June. The B nest for Pair 1 was marked 30 June as a complete clutch, 15 days after we found the second chick in Nest A dead. The B nest was thus begun a few days before we found it, giving an interval of under 15 days between the death of the chick in Nest A and the first egg of Nest B. The first egg of the B nest for Pair 6 was laid 19 days after the second young in the nest hatched. This was the longest interval for any of the nests.

*Pairs 1 and 2, 1979.*—Although neither of the nests that we watched in 1979 was successful, the behavior we observed in the incubating birds and their young provide comparative data. On 5 July 1979 I noticed a pair in which the female was incubating two eggs, both marked on 30 June, while the male was feeding a 25-day-old young. My attention was drawn to the nest because the juvenile stayed very close to the incubating female, standing less than a meter from her and begging or lying close to her as she incubated (Figs. 1a and 1b).

I set up a watch at this nest between 6 and 20 July. Table 3 is a summary of time the male and female of Pair 1 spent incubating and the number of fish brought to the nest. On the morning of 15 July one egg was missing; the

TABLE 2. Laying and hatching data for pairs laying successive clutches of eggs on Great Gull Island, New York.

| | Nest A | | | Nest B | | | |
|---|---|---|---|---|---|---|---|
| Pair | Egg marked | Chick hatched | Fate[a] | Egg marked | Fate[a] | Chick hatched | Fate[a] |
| 1 | 16 May | 11 June | F | 30 June | 14 July-0 | | |
| | 20 May | 12 June | 15 June-X | 30 June | 21 July-D | | |
| 2 | 16 May | | 0 | 9 July | 26 July-D | | |
| | 21 May | 9 June | 29 June-X | 11 July | 26 July-D | | |
| | 21 May | 11 June | F | | | | |
| 3 | 16 May | 9 June | F | 22 June | | 16 July | F |
| | 22 May | 12 June | 16 June-X | 23 June | | 16 July | 22 July-0 |
| 4 | 28 May | 19 June | F | 29 June | 7 July-D | | |
| | 28 May | 20 June | U | | | | |
| 5 | 19 May | 17 June | F | 30 June | 10 July-0 | | |
| 6 | 17 May | | U | 1 July | 21 July-D | | |
| | 22 May | 12 June | F | 4 July | 21 July-D | | |

[a] D = deserted, F = fledged, U = unknown, X = dead, 0 = disappeared.

other egg lay about 25 cm away, and I replaced it in the nest. Black-crowned Night-Herons (*Nycticorax nycticorax*) were nightly predators throughout 1979 and were probably responsible for the damage. Following the disturbance, the male did almost no incubating (Table 3). The time he spent on the nest dropped from 37.5% of the hours observed during the first 8 days to 1.9% during the last 5 days. The time that the female spent on the nest also dropped after the disturbance from 57% during the first period to 32.1% during the last 5 days. The nest was unattended 6% of the time during the first 8 days of the watch and 66% during the final period.

Coincidental with the male's drop in incubating time was an increase from 53% to 69% in his contribution to total fish brought to the young and a decrease in the female's contribution from 47% to 31% (Table 3).

On 9 July 1979 the female of Pair 2 incubated a single egg while the male fed a 28-day-old young. The juvenile stayed near and was fed there most of the time through 13 July, when it was 32 days old. During this period the male averaged 1.5 (30%) and the female 2.6 (52.2%) h of incubation in a daily 5-h watch period.

From 16 to 26 July neither the male nor the young, now over 5 weeks old, spent much time at the nest. The male left the area in the morn-

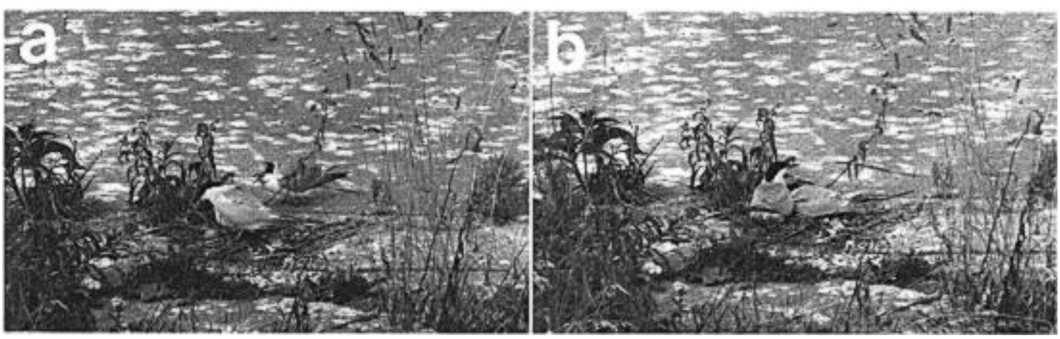


Fig. 1. (a) Juvenile begs as adult female of Pair 1 lowers herself on eggs. (b) Juvenile from Nest A of Pair 1 typically lies close to incubating adult.

TABLE 3. Incubating time and numbers of fish brought by Pair 1 before and after predation of one egg of Nest B.

| | 6-14 July (%) | 15-20 July (%) |
|---|---|---|
| Hours incubated by ♂ | 26.4 (37%) | 1.0 (2%) |
| Hours incubated by ♀ | 40.3 (57%) | 17.1 (32%) |
| Hours nest unattended | 4.2 (6%) | 35.1 (66%) |
| Total hours observed | 70.9 | 53.2 |
| Fish brought by ♂ | 50 (53%) | 40 (69%) |
| Fish brought by ♀ | 44 (47%) | 18 (31%) |

ing, and the young flew after him. Both stayed away for most of the day, and the female incubated for the entire day. After 25 July no bird incubated. I opened the eggs and found two dead embryos. On the basis of their size and appearance (Hays and LeCroy 1971), I estimated they had developed for 11-12 days.

*Pairs 3, 4, 5, and 6, 1980.*—In 1980 we found four pairs (3, 4, 5, and 6) that were feeding young while one or both members of the pair sat on a new clutch of eggs. Pair 3 succeeded not only in raising one young from Nest A, but also fledged one young from Nest B.

On 7 July 1980 I set up a watch on Pair 3 6 days before the hatching of Nest B and continued it through 14 August. Overall, the female did little feeding throughout the watch period, bringing in 15% of the fish in contrast to the 85% brought in by the male (Table 4). These figures are the most disparate of any of those of the five pairs we have watched intensively in previous years. In other instances males brought about 60% and females 40% of the fish fed to their young. The female of Pair 3 did most of the incubating, however. Initially, she incubated 82% of the time observed and the male 18% (Table 4); during the 2 days before hatching, the female did all the incubating.

From 16 July, the day of hatching, through 20 July the female brooded 65% of the time during the hours observed and the male 14%. Until 18 July we saw the juvenile from Nest A fed at the nest site. On 18 July the female chased the fledgling, now 32 days old, from the nest area twice. We did not see the young from Nest A at the nest site after 18 July.

On the morning of 21 July the male attempted copulation with the female. On this same date we observed the younger chick from Nest B wandering away from the nest for distances up to 4.6-6.1 m. The chick was small and was not being fed by its parents. By 22 July the younger chick had disappeared. From 21 July through 3 August we observed the female standing in the nest area 51% of the time observed and the male 10%. On occasion, partic-

TABLE 4. Incubating time and numbers of fish brought by Pair 3 for their second clutch of the season on Great Gull Island in 1980.

| | Inclusive dates | | | |
|---|---|---|---|---|
| | 7-15 July | 16-20 July[a] | 21 July-3 August | 4-14 August |
| Number of days | 6 | 5 | 13 | 11 |
| Hours observed | 65.7 | 58.6 | 140.5 | 125.2 |
| Male | | | | |
| Incubating[b] | 11.9 (18) | | | |
| Brooding[b] | | 8.0 (14) | | |
| Present[b] | | 2.2 (3) | 15.2 (10) | 0.4 (0.3) |
| Female | | | | |
| Incubating[b] | 53.8 (82) | | | |
| Brooding[b] | | 38.1 (65) | 2.2 (2) | |
| Present[b] | | 3.9 (7) | 71.6 (51) | 5.9 (4.7) |
| Nest unattended | | 6.4 (11) | 51.5 (37) | 118.9 (95) |
| Fish brought by | | | | |
| Male[c] | 17 (94) | 26 (90) | 81 (82) | 111 (84) |
| Female[c] | 1 (6) | 3 (10) | 18 (18) | 21 (16) |

[a] Hatching date = 16 July.
[b] Hours spent in activity; percentage in parentheses.
[c] Number brought; percentage in parentheses.

ularly at the beginning of this period, the female appeared to attempt to brood the young, but it would not stay under her. During the last 11 days of the watch, the time that the nest was unattended by either parent went up to 95% (Table 4). The young from Nest B first flew on 12 August and was last seen at a little over 6 weeks of age flying in to roost on the island on 2 September.

The two chicks from Pair 4's first nest hatched on 19 and 20 June. The younger chick disappeared after 6 days. While the adults fed the first chick I saw the female incubating a new egg marked on 29 June. The female sat on the egg at times for about 1 week and then did not sit any more. We never saw the male on the egg.

Pair 5 hatched their single chick in Nest A on 17 June, and we found the female of the pair was sitting on an unmarked egg 30 June. The female sat on the egg sporadically throughout a 10-day period. I saw the male at the nest only once, when he stood over the egg during a rain. The egg disappeared after 10 July.

Pair 6's chick from Nest A hatched 12 June and survived to fledging. The female sat on two more eggs, marked on 1 and 4 July, but deserted them after a few days.

## DISCUSSION

In 1979 and 1980 we found a total of six pairs of Common Terns incubating a second clutch of eggs while still feeding a single young from their first brood. One pair raised one young to fledging from each of its successive nests, demonstrating that recycling can be a successful strategy for increasing the number of young produced in a season by a pair.

A close look at the behavior of Pairs 1, 2, and 3 gives some insight into possible mechanisms that might trigger recycling. In the instances I will discuss, brood reduction, imposed by outside factors or variation from the normal incubating and feeding patterns of the female, sets the stage for recycling. The response by the female and/or the male to the disruption or change in the pattern provides a mechanism for triggering recycling.

All pairs that laid successive clutches in 1979 and 1980 were feeding only one young at the time we marked the eggs in Nest B. The timing of the appearance of the eggs in the successive clutch, following, in most cases, the death or loss of one of the young in Nest A, suggested that recycling might occur in situations where the adults had brought in more fish than the remaining young could consume. This is rather dramatically shown by our data for Pair 2. The pair had been raising two young from Nest A for almost 3 weeks. The first egg of Nest B was laid within 10 days of the time we found the older chick from Nest A dead near the nest at 20 days of age.

Only Pair 5 hatched a single chick in the A nest. All other A nests were reduced to a single chick, and, with the exception of Pair 3, the first egg of the B nest was deposited within 9–19 days of the time the reduction or loss took place. In both years I noted that, on occasions when the young were not present to take the fish from a returning adult, either the bird bringing the fish gave it to the adult waiting at the nest and the latter ate the fish or the bird that brought the fish ate it. Courtship behavior often includes feeding of the female by the male at the nest site. Nisbet (1977) has given courtship feeding a functional significance by suggesting that females depend on the male to provide food before egg laying. It seems reasonable to hypothesize, therefore, that extra fish brought to the nest site might lead to courtship feeding and recycling.

Pair 3's recycling seems to have been triggered less by the loss of a second chick than by the behavior of this particular female. Recycling takes a minimum of 9 days, and Pair 3's first egg of Nest B appeared 6 days after we found the second chick in the A nest dead. It would appear that the female in this case began recycling just after the second chick in Nest A hatched. Given this particular female's strong tendency to incubate and brood, one might hypothesize that she may have responded to absence of eggs and presence of chicks in Nest A by recycling, and/or she may have been fed by the male during the 3-day interval between the hatching of the first and second eggs in the A nest and courting behavior and recycling followed. We noted during the watch on Pair 3's B nest that the male copulated with the female and displayed with her when he found her standing at the nest site 5 days after the eggs hatched in Nest B. The Pair 3 female never changed from incubating and brooding to bringing in fish for the young with any regularity or frequency, as had been the case with females we had watched in previous years. It seems probable that this particular female's strong tendency to incubate and brood kept her near the nest site, where her interactions with the male there led to recycling.

Brood reduction in the case of Pair 3 was also, I feel, a function of this particular female's behavior. The fact that she did not switch to regular feeding behavior at her B nest probably resulted in the death of her second chick in that nest. It seems very probable that she exhibited similar behavior earlier in the season, which perhaps caused the death of the second chick in the A nest as well.

The years when we found successive clutches were also years of considerable predation by Black-crowned Night-Herons. Production of fledglings in 1978 was about half that of previous years, with a slight increase for 1979 and 1980. Nicholls (1974) reported significant predation by King's skink (*Egernia kingii*) and the tiger snake (*Notechis scutatus*) in the colony of Silver Gulls she observed on Carnac Island, Western Australia; of 50 pairs observed, 40% failed to raise young. She pointed out that this figure is similar to what Serventy and White (1943) noted in 1941 for Silver Gulls nesting on Shag Island 40 km distant from Carnac; there 50% of 88 pairs of Silver Gulls failed to raise young.

The coincidence of heavy predation in the Great Gull Island colony with the occurrence of successive clutches in certain pairs of Common Terns, and of double clutching in Silver Gulls on Carnac Island, does not in itself imply a causal relation between these factors. It does lead to speculation, however, that the reduction of a clutch or brood caused by predation might result in the pair bringing in more fish than the remaining young could consume, and this could lead to recycling. The behavior of the male and female of Pair 1 following the disturbance in which one egg was lost and the other displaced from the B nest again suggests this possibility. The male's incubating time dropped to almost nothing, and his feeding visits increased. The female spent more time away from the nest, incubating only sporadically, and made fewer feeding visits. It seems conceivable that, depending on the timing of the disruption in the nesting cycle, the kind of disruption (egg disappearance, chick disappearance), and the reaction of the parents, a change in behavior such as an increase in feeding behavior by the male and decrease in incubation/brooding by the female might lead to courtship feeding and recycling in the pair.

Based on my data to date, I think that predation was a strong factor influencing the occurrence of the successive clutches we observed in the Great Gull Island colony in 1979 and 1980. Most Common Tern clutches in the Great Gull Island colony are composed of 2 or 3 eggs, and there are very few 1-egg clutches in any particular season. Given a good food supply, parents that share equally or almost equally in feeding their chicks are able to raise two or three young. We would not under ordinary conditions expect to observe numbers of nests in which the parents were raising just one young.

Individual variation in male and female feeding rates, as I've described for Pair 3, would suggest that it is possible that certain pairs might regularly attempt a second clutch while still feeding young from their first brood. These individuals would be hard to detect in any colony, however, I would hypothesize that not until many nests suffered from incomplete hatching, due perhaps to an environmental contaminant or, as in this case, fairly heavy predation, would successive clutches occur with a frequency that would make them easily detectable.


## ACKNOWLEDGMENTS

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## LITERATURE CITED

COOPER, D., H. HAYS, & C. PESSINO. 1970. Breeding of the Common and Roseate terns on Great Gull Island. Proc. Linnaean Soc. New York 73: 83-104.

DICOSTANZO, J. 1980. Population dynamics of a Common Tern colony. J. Field Ornithol. 51: 229-243.

HAYS, H., & M. LECROY. 1971. Field criteria for determining incubation stage in eggs of the Common Tern. Wilson Bull. 83: 425-429.

HAYS, H., & R. W. RISEBROUGH. 1972. Pollutant concentrations in abnormal young terns from Long Island Sound. Auk 89: 19-35.

KING, H. F. 1913. Gulls nesting in captivity. Emu 12: 279.

NICHOLLS, C. A. 1964. Double-broodedness in the Silver Gull, *Larus novaehollandiae.* West Australia Nat. 9: 73-77.

———. 1974. Double-brooding in a Western Australian population of the Silver Gull, *Larus novaehollandiae* Stephens. Australian J. Zool. 22: 63-70.

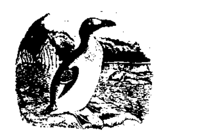
NISBET, I. C. T. 1977. Courtship-feeding and clutch size in Common Terns. Pp. 101-109 *in* Evolutionary ecology (B. Stonehouse, Ed.). London, MacMillan.

SERVENTY, V. N., & S. R. R. WHITE. 1943. Birds of Warnboro Sound, Western Australia. Emu 43: 81-95.

WIGGINS, D. A., R. D. MORRIS, I. C. T. NISBET, & T. W. CUSTER. 1984. Occurrence and timing of second clutches in Common Terns. Auk 101: 281-287.

YTREBERG, N.-J. 1956. Contributions to the breeding biology of the Black-headed Gull (*Larus ridibundus* L.) in Norway. Nytt Magasin Zool. 4: 54-99.

# 100 Years Ago in The Auk



From "A Plea for the Metric System in Ornithology," by C. Hart Merriam (1884 Auk 1: 203-205):

"It seems to me extremely unfortunate that most of our ornithological writers persist in the employment of the confusing and irrational system of inches and hundredths, or, still worse, inches and lines, in the measurement of birds and their eggs .... The metric system is so simple, and its advantages so numerous, that it has already become the acknowledged standard in all departments of science. Certainly none will gainsay that its universal adoption is inevitable sooner or later. Then why defer the hour and thereby increase the already too great number of measurements that must eventually be reduced to the metric system? The labor of converting a series of measurements from one scale to another is not small, and life is too short for busy men to be obliged thus needlessly to waste valuable time .... A glance at the scientific journals of the day shows that this system is in vogue in all parts of the world, not only among physicists and chemists, but also among naturalists. Even in the United States it is largely employed by mammalogists, osteologists, palaeontologists, herpetologists, and ichthyologists; by those engaged in the study of our invertebrates, and by botanists. Why then should American ornithologists, who desire and profess to keep abreast of the progress of knowledge in their department, permit themselves to postpone the acceptance of this most useful addition to their armamentarium by the continued employment of a scale of linear measure that is incommensurable with others, incongruous in itself, and fast becoming obsolete?"

From "Notes and News" (1884 Auk 1: 207):

"The A.O.U. Committee on the 'Classification and Nomenclature of North American Birds' has held a second session in Washington, lasting eighteen days, which was devoted mainly to a consideration of the status of the species and subspecies. From the progress already made, it seems probable that the Committee will be able to make a detailed and final report to the Union at its next meeting."