field guide to the birds of Texas" (Boston, Houghton Mifflin Co., 1960), the Jaçana has nested in the Rio Grande delta near Brownsville. There is also a sight report by Gene W. Blacklock (Audubon Field Notes, 22: 626, 1968) of an adult and one chick near Kingsville, Texas in 1968.

On 22 June 1971 H. M. Garner and I investigated a herony at Eaglenest and Manor Lakes, approximately 17 miles northwest of Angleton, Brazoria County, in the southeastern part of Texas, a subregion of the coastal plain. John J. Jones, custodian of the lakes, which are leased and managed as a hunting and fishing preserve, told us he had seen two adult Jaçanas on 20 June on the upper part of Manor Lake. We went to the locality by boat, but failed to see the birds. Both Mr. and Mrs. Jones maintained they had seen Jaçanas since the fall of 1968 and that they are present throughout the year. I asked them to watch the Jaçanas and keep records.

In August Jones reported to Garner that he had seen a pair of adults with three young only a few days old, and Jones continued to see adult and young birds almost daily in September and October 1971. On 7 November Garner saw three immature and three adult birds on an arm of Manor Lake near the Jones residence, where the Joneses had previously observed three adults and four immatures.

Manor Lake, comprising approximately 1,200 acres, is nearly ¾ of a mile wide and over 1 mile long, generally rectangular in shape. Water is not over 5 feet deep, except where alligators have their holes. About one-third of the lake is open water and the remaining two-thirds is covered with clumps of California bulrush, American lotus, and maidencane. Draws and a slough entering the lake are choked by water hyacinths. The water level is kept fairly constant by pumping, so the habitat is ideal for this tropical bird.

On 1 December 1971 Garner and I made another trip to Manor Lake, arriving at 07:50. We immediately found three adults and three immatures feeding on the mass of water hyacinths. The lake apparently supports a small breeding colony. General the Jaçanas can be seen through the window of the Jones' residence. Several other observers have seen and photographed the birds.

An immature bird, possibly from this colony, wandered to the Brazoria National Wildlife Refuge during the last week of December 1969 and spent 4 months on a short stretch of Big Slough. The Brazoria Refuge occurrence represents the most northeastern record for Texas.

I am grateful to Mr. and Mrs. John J. Jones and H. M. Garner for their cooperation and data.—RAYMOND J. FLEETWOOD, *Bureau of Sport Fisheries and Wildlife, Angleton, Texas 77515.* Accepted 17 Mar. 72.

Egg size and shell thickness in the Franklin's Gull.—Decreases in eggshell thickness have been reported in wild populations of many raptorial and fish-eating birds, and these decreases have been shown to be related to an increase in chlorinated hydrocarbons in ecosystems (cf. Hickey and Anderson, 1968; Anderson et al., 1969, Porter and Wiemeyer, 1969). I have used the thickness index developed by Ratcliffe (1967) to estimate eggshell thickness for Franklin's Gull, *Larus pipixcan.* Thickness index, in order to relate best to thickness, must always assume a constant eggshell density between groups being compared. This may not be true in all cases of chemical effect (see McFarland et al., 1971).

Shell thickness indices for 60 eggs (20 clutches) T. S. Roberts collected at Heron Lake, Jackson County, Minnesota, in 1893, were compared with 20 clutches I collected in 1969 at Agassiz National Wildlife Refuge, Marshall County, in north-

TABLE 1
THICKNESS INDICES OF FRANKLIN'S GULL EGGS

Year	N	$\bar{X}$	SD
1893	60	1.14	0.064
1969	60	1.11	0.068

western Minnesota (Table 1). A single classification analysis of variance followed by a sums of squares simultaneous testing procedure (Sokal and Rohlf, 1969) at the 0.05 level revealed no significant difference in the thickness index between the two samples. The Franklin's Gulls around the breeding colony feed largely on insects and earthworms in farm fields having minimal DDT use. The 1969 sample was also analyzed for shell thickness index variation between the first, second, third eggs of the normal first clutch, and replacement eggs: no significant differences were found (Table 2). It is apparent that eggshell thickness index in Minnesota populations of Franklin's Gulls has not changed over the past 80 years, and also that clutch sequence has no large effect on shell thickness index.

For a given species at least three factors must be considered in a study of egg dimensions: sequence of laying, age of the female, and geographical location. For several species of birds the last laid egg is the smallest one within the clutch, and in other species the last egg laid is the largest (Barth, 1968). Egg size is related to the age of the female; older birds lay larger eggs (cf. Richdale, 1955; Nelson, 1966; Coulson et al., 1969). Coulson (1963) proposed a method of estimating the age composition of a colony by using egg measurements. Geographic variation also occurs, as shown by Barth (1968), who found the largest *Larus marinus* and *L. argentatus* eggs and the smallest *L. fuscus* and *L. canus* eggs in the northern (Norway) samples. Anderson et al. (1970) found significant geographical variation in the eggs of Common Loons, *Gavia immer*.

In the present study length and breadth measurements were analyzed for differences between the 1893 and 1969 samples (Table 3). Also included in this table are measurements of eggs from a Franklin's Gull colony in central Alberta (taken from Guay, 1968). There was a significant difference ($P<0.05$) in length and breadth measurements between the 1893 and 1969 samples; these could not be compared with the Guay sample for significance.

The 1969 sample was analyzed for differences in length and breadth among the first, second, third, and replacement eggs (Table 4). There were no significant differences at the 0.05 level in lengths or breadths in the three-egg clutches. The breadths of replacement eggs (eggs 4, 5, and 6) were significantly different from

TABLE 2
THICKNESS INDICES OF SUCCESSIVE EGGS WITHIN CLUTCHES, 1969

Egg	N	$\bar{X}$	SD
1	20	1.11	0.070
2	20	1.12	0.082
3	20	1.11	0.051
4	11	1.13	0.076
5	5	1.07	0.114
6	5	1.09	0.120

TABLE 3
EGG MEASUREMENT (IN MM) OF FRANKLIN'S GULL

Origin and Year	N	Length $\bar{X}$	Length SD	Length Range	Breadth $\bar{X}$	Breadth SD	Breadth Range
Minnesota							
1893	60	52.9	1.73	48.0–57.0	37.3	1.23	34.2–41.3
1969	60	52.0	2.18	48.6–57.5	36.6	0.97	34.8–38.8
Alberta							
1964–66	86	51.9	—	47.7–56.8	36.1	—	31.8–38.7

the first and second eggs of a clutch but were not different from the third egg. Preston (1968) proposed that adequate sampling procedures consist of measuring one randomly chosen egg from each of 20 clutches. My data suggest that significantly different means could result if eggs were collected at different times during the egg-laying period, depending upon the percentage of replacement clutches.

At present it is not possible to determine if the significant differences in length and breadth between the 1893 and 1969 eggs represent different age structures or geographical variation. As Guay's measurements of eggs from a more northern colony (Alberta) were different from the Minnesota samples, they may reflect geographical variation.

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TABLE 4
MEASUREMENTS (IN MM) OF CONSECUTIVE EGGS IN FRANKLIN'S GULL

Egg number	N	Length $\bar{X}$	Length SD	Length Range	Breadth $\bar{X}$	Breadth SD	Breadth Range
1	20	51.2	1.91	49.0–57.2	36.5	0.99	34.8–38.2
2	20	52.1	2.15	48.6–57.5	36.9	0.78	35.5–38.3
3	20	52.8	2.28	48.6–56.5	36.4	1.08	34.8–38.8
4–6	21	51.8	1.56	49.3–54.5	35.5	1.38	33.5–38.8

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Propagation of Barn Owls in captivity.—Some aspects of the biology and life history of native birds often are more readily obtained in captivity than in the field. This is particularly true in evaluating the effects of pesticides or other pollutants on birds, because establishing cause-and-effect relationships requires experimental studies. Few wild species have been bred in captivity with sufficient success to permit the large-scale studies that are needed. This paper reports successful efforts to breed Barn Owls (*Tyto alba pratincola*) in captivity and presents biological data concerning reproduction.

I collected 6 Barn Owl eggs on the lower Potomac River in St. Mary's County, Maryland, on 9 April 1968 between 10:00 and 14:00, taking 2 eggs from each of 3 nests in offshore duck blinds, and put them under a broody Bantam hen at the Patuxent Wildlife Research Center in Laurel, Maryland, at approximately 18:00. Three of the six eggs hatched after 21, 24, and 29 days of incubation. The incubation period for the Barn Owl has been reported to range from 21 to 24 days (Bent, 1938) and from 30 to 34 days (Wallace, 1948; Kendeigh, 1952; Honer, 1963). Although we do not know how long the study eggs were in the nest before being collected, the incubation period must be at least 29 days.

The newly hatched owls were immediately brought indoors and placed on a layer of wood chips in a cardboard box. A constant temperature of 85–90°F (29.5–32°C) was maintained by suspending a heat lamp above the box. For the first 2 weeks the young owls were hand-fed three or more times a day. The finely chopped diet contained 1/3 whole rats, 1/3 whole hamsters, 1/6 chicken heads, and 1/6 chicken necks minus the skins. Steamed bone meal and vitamin supplement were added to the diet. The young owls cast pellets daily commencing the second day after