tradict this interpretation, and the presence of a large stork seems to support their view that this fauna lived in a warm, interglacial period. The birds are as follows.

Podiceps auritus. Horned Grebe.—The proximal end of a right tarsometatarsus (UMMP no. 52225) is indistinguishable from tarsi of *Podiceps auritus*. The specimen is slightly worn and the cnemial crest is missing.

Stork, *cf. Ciconia maltha* L. Miller.—A fragment of a synsacrum (UMMP no. 52599) that has been slightly distorted laterally is clearly that of a large stork. The fossil is similar in size and contours to synsacra of *Euxenura maguari*. According to Miller (*Univ. California Publs. Geol.*, 5[30]: 440, 1910), the large Pleistocene stork *Ciconia maltha* was apparently the same size as *Euxenura*. No other large stork is known from the Pleistocene of North America (P. Brodkorb, *Bull. Florida State Mus.*, 7[4]: 289–290, 1963), and it is probable that the Sand Draw specimen is referable to *C. maltha*. However, *C. maltha* is presently known only from Middle and Upper Pleistocene deposits (Brodkorb, *loc. cit.*) and it does not seem wise to extend the range of this form into the Lower Pleistocene on the basis of an imperfect specimen.

Branta canadensis. Canada Goose.—An unworn left coracoid (UMMP no. 52170), complete except for tip of sterno-coracoidal process, is that of a Canada Goose. The element measures 65 mm from head to internal distal angle and is similar in size to coracoids of the larger races of *B. canadensis*.

Bucephala albeola. Bufflehead.—The Bufflehead is represented by parts of two femora. The left femur (UMMP no. 52597) is nearly complete and lacks only the distal condyles. The shaft shows the characteristic abrupt bend attributed to *Bucephala* by G. E. Woolfenden (*Bull. Florida State Mus.*, 6[1]: 72, 1961). This element is 36 mm long and the length of the intact bone is estimated at 36.5 mm. This length is within the range of female *B. albeola*; femora of nine females range from 33.7–38.0 mm, with a mean of 35.1 mm.

The second fragment (UMMP no. 52598), the distal end of a right femur, is not separable from femora of male *B. albeola*.—JOSEPH R. JEHL, JR., *Museum of Zoology, The University of Michigan, Ann Arbor, Michigan.*

Aerial census of Laysan Albatrosses breeding on Midway Atoll in December, 1962.—In the course of a conversation with Captain Robert F. Burke, of the Foreign Technology Division of the U. S. Air Force, I mentioned the difficulty in censusing the Laysan Albatross, *Diomedea immutabilis*. He and the crew of his photographic reconnaissance plane most graciously offered to make a low-level photographic survey, if I could get permission from the Naval Commander, Captain N. D. Johnson. This request was granted immediately.

My sincere appreciation goes to both these gentlemen, and to Willard D. Klimstra and Robert D. Klemm who assisted in making ground counts of albatrosses and their nests, to Keith Thomas and to Mrs. Mildred L. Fisher for assistance in tallying birds in the prints, and to the latter for aid in computing the scale of magnification for each film strip. For continuing support of my research on these birds, I wish to thank the Office of Naval Research, Contract 3479(00).

Procedure.—On 3 December 1962, mid-day, flights were made at an altitude of 400 feet over Sand Island and at 500 feet over Eastern Island. Juxtaposition of flight lines provided nearly 50 per cent overlap, as did the six-inch focal length Zeiss RMK 15/23 charting camera for successive frames in the roll film (Eastman SO-136, Aerial Panatomic X) exposed at f 5.6 at 1/1000 sec. The negatives were printed at Southern Illinois University after deletion of frames showing classified installations.

TABLE 1

NUMBER OF LAYSAN ALBATROSSES COUNTED IN VARIOUS HABITATS

Number of plots	*Habitat*	*Average number of birds per square yard*[1]
3	*Scaevola*	0.083
3	Open trees, no undergrowth	0.038
3	Scattered trees in *Scaevola*	0.143
2	Strips of edge ten yards wide	0.199

[1] Based on two counts per plot.

TABLE 2

SIZE OF BREEDING POPULATIONS OF LAYSAN ALBATROSSES BASED ON AERIAL CENSUSING

Locality	*Number of birds*	
	Observed	*Calculated*
Eastern Island		
In open areas	39,521	64,900
Beneath *Scaevola*		22,500
Beneath ironwood trees		900
		(Total, 88,300)
Sand Island		
In open areas	11,637	19,000
Beneath *Scaevola*		24,000
Beneath ironwood trees		24,000
Beneath mixed stand of *Scaevola* and trees		25,000
		(Total, 92,000)
Two islets between Sand and Eastern islands	39	65

Some of the surface of each island is covered by ironwood (*Casuarina*) trees, by the woody shrub *Scaevola*, or by a combination of these that would hide birds from aerial spotting. Therefore, two counts (3 and 4 December) of birds and of nests with incubating birds were made on 11 measured plots of different ecological situations on Sand Island. In all, some 16,000 square yards, holding 943 birds, but representing a breeding population of about 1,500 birds (see below), constituted the sample. The two counts for each plot varied less than 5 per cent and averages were used (Table 1).

On the aerial photographs each bird appeared as a dark ovoid, with a white dot representing the head. Under 10× magnification each dot was punched with a pin; counts of the pin holes were made on the reverse side. Areas of trees, of *Scaevola*, of trees in *Scaevola*, and of suitable edges were calculated from the photographs and estimates of birds present in these areas were made using the information presented in Table 1.

Analysis.—I estimated that three-fourths of the pairs on Sand Island had started incubation. Corroboration of this opinion came from data collected in a study plot on adjacent Eastern Island where each nest is marked and visited daily. On that island, in 1961, 82 per cent of an eventual total of 378 eggs had been laid by 3 December; in 1963, 75 per cent of 708 eggs were present; in 1964, 79 per cent of 350

eggs. The plot could not be visited in 1962 until 6 December, but by then 87 per cent of the final number of eggs had been produced.

Further, if we calculate the ratio of twice the number of birds on eggs to the total number of birds, we find that, in the 11 counts, from 71 to 85 per cent of the eggs had been laid. The total number of birds is considered to be the number of birds observed which were not incubating plus twice the number incubating. It is reasonable to calculate the total in this manner, since the female usually leaves the nest and goes to sea within 36 hours after laying. (Even if some females that had laid were included, the error should not have exceeded 5 per cent, which was the maximum daily rate of egg laying at this time.) Further, the numbers of birds in the various colonies had reached their maxima, as subsequent ground counts on 10–12 December revealed. Finally, on 18 December a check of the 11 areas showed an average increase of 14 to 24 per cent in the number of nests in those places not disturbed by Navy personnel. Therefore it seems justifiable to use 78 as the percentage of pairs with eggs at the time of the census.

It may be argued that "unemployed" birds were present. However, the definition of "unemployed" is not firm and the term is equivocal in albatross study before eggs are laid. Also, the time factor is especially critical in a species which has successive "waves" of arrivals of different age groups.

Rice and Kenyon (*Auk*, 79: 365–386, 1962) stated (pp. 365–366) that ground surveys made in "late November and December" on Midway "indicated that 25 per cent of the albatrosses visible on the photographs [aerial] were unemployed. Therefore, we reduced our counts by 25 per cent to estimate the number of nests." However, after four years of observation at the beginning of the nesting season, I think that 25 per cent for unemployed birds is too high a figure for late November or for the first week of December, by at least a factor of four. Even in mid-December after the first major influx of non-breeders, the number of birds not readily identifiable at any one time with egg or nest does not nearly equal this percentage.

On a typical plot on 3 December, 125 birds, 70 on eggs, were counted. Therefore, by using the ratio given above, we would consider that 72 per cent of the birds were involved with eggs already laid. If the 55 birds not with eggs consisted of pairs (27), then 97 nests in all should have been present by the end of egg laying. On 18 December, 27 additional nests should have been found; only 19 were present but 3 additional ones were known to have been destroyed and 2 others to have been deserted. The 3 per cent difference between the number of nests expected (97) and those found or accounted for (94) may have been the result of sampling error, or the presence, at the time of the initial count, of "unemployed" birds or of females who had already laid an egg. The other areas showed differences between expected and actual numbers of nests ranging between 2 and 6 per cent.

In summary, I think that for each 200 birds (100 pairs) at this season, 78 (39 per cent) will be observed on the egg, 44 (22 per cent) will be birds observed not on an egg, and 78 (39 per cent) will be mates (not observed) of birds on eggs. Birds actually observed would then equal 61 per cent of the total population breeding that year. Using these procedures and methods of calculation, I arrived at the estimates of the number of breeding Laysan Albatrosses on these two islands as shown in Table 2.

Comments.—The only census of possible use for comparison with this is that by Rice and Kenyon (*op. cit.*). On Eastern Island they counted nests in January and February on half the island and "corrected to early December" thus making their dates and breeding stages nearly the same as in the present study. They estimated 44,000 nests in 1956–57. They also calculated 60,000 nests on the basis of plot counts

on Sand Island in mid-December, 1956, but it is not clear to me whether they did or did not adjust for the 5 to 15 per cent egg loss normally expected in the first month of nesting.

Their data on nests would indicate 88,000 breeding birds on Eastern, the same as my assistants and I found six years later. Sand Island's population has been reduced from a minimum of 120,000 breeders in 1956–57 to 92,000 in 1962–63, a decrease of nearly one-fourth. If Rice and Kenyon did reduce their calculated number of nests by 25 per cent because of "unemployed" birds (I am not clear as to which islands they did this for) and if they failed to correct for nest mortality between 20 November and "mid-December" or "early December," and if it is true, as I think, that there are not this many "unemployed" birds in November and the first week of December, then the decrease over these years may have been nearer 50 than 25 per cent. It is surprising, however, that the decrease was not greater, in view of the government sponsored "control" programs, the human molestation of nesting birds, and the unauthorized disturbance of the habitat. The numbers present in 1962 may indicate a great resiliency of this population—the ability of these long-lived birds to "come back" after major catastrophes which have been suffered repeatedly on their restricted breeding grounds.

However, it is inadvisable to place too much weight on comparison of the censuses of two isolated years. For the past four years I have been keeping detailed records on a surveyed study plot on Eastern Island, and it is apparent that major fluctuations in breeding populations (20 to 50 per cent) may occur between successive years. In fact, it seems that breeding may be cyclic, although too few years are as yet included in the study for my co-workers and me to be certain.—HARVEY I. FISHER, *Southern Illinois University, Carbondale, Illinois.*

First specimen of the Long-tailed Jaeger from the northern Gulf coast.—L. E. Williams, Jr. (*Auk*, 82: 19–25, 1965), reports only two specimens and four sightings of the Long-tailed Jaeger (*Stercorarius longicaudus*) from the Gulf of Mexico. One of the specimens was taken at Marco, Florida, in the winter of 1884, the other at Matanzas Bay, Cuba, on 29 November 1937. Of the sight records, two are for Florida, one for Texas, and one for Louisiana. The Louisiana sight record must be questioned since the original reference (*Aud. Field Notes*, 12: 361, 1958) contains no definite statement regarding the specific identification of the bird, which is referred to simply as a "jaeger with very white underparts and very long central tail feathers." H. B. Moore (*Bull. Marine Sci. Gulf and Caribbean*, 1: 1–14, 1951) mentions two additional sightings from the north-central Gulf of Mexico on 9 March and 6 April (year not given).

On 24 April 1965, we collected a Long-tailed Jaeger near the west jetty of Calcasieu Pass, Cameron Parish, Louisiana. This specimen represents the first definite record of the Long-tailed Jaeger in Louisiana, and is, moreover, the first specimen of this species to be taken in the Gulf of Mexico west of the peninsula of Florida. The jaeger was first observed sleeping on a sandbar approximately 500 yards from the shoreline. As we approached the bird, it became alert, and we collected it as it sprang into flight. The specimen is a light-phased female (ovary, 22 × 5 mm, largest ovum, 1 mm) and had brilliant blue-gray tarsi. The single central tail feather is only 13.5 mm longer than the other rectrices. The specimen has been deposited in the Louisiana State University Museum of Zoology (no. 35513).—ANGELO W. PALMISANO, JR., *School of Forestry and Wildlife Management*, and SIDNEY A. GAUTHREAUX, JR., *Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana.*