

On the basis of normal distribution, 99 per cent of all individuals may be expected to be included in a range indicated by the mean, plus or minus three standard deviations, and 95 per cent in plus or minus two standard deviations. Thus, the theoretical range of each set of measurements of *G. nannodes* may be set up. To indicate the greatest possible range, the mean should be set up: (1) as three standard deviations below the single measurement; or (2) three standard deviations above the measurement; or (3) as the single known measurement. This method sets up three possible curves to represent the fossil population, and each curve is based on the single measurement used in different positions.

If we assume the actual mean of each dimension of the fossil population lies at a position three standard deviations above the recorded measurement, the upper limits of the ranges of all dimensions of the fossil fall within the 99 per cent limits of *canadensis*. Use of each single measurement in *nannodes* as a simple mean indicates that in all dimensions, except distal width, the fossil falls within the expected range of 99 per cent of the *canadensis* specimens. If the mean for each measurement of the fossil is assumed to lie three standard deviations below the recorded measurement, all mean dimensions of *nannodes* are outside the 99 per cent limits of *canadensis*.

If the ranges are calculated on a 95 per cent limit ($M \pm 2\sigma$, table 1) all dimensions of *nannodes* fall outside the 95 per cent limits of *canadensis*. Thus the probability that measurements of *nannodes* are part of the variability of *canadensis* is less than five per cent. All indications are that the measurements of *nannodes* reflect means which are different from those of *canadensis*.

Therefore, it is likely that *Grus nannodes* is actually a different and smaller crane. This is of interest, for in many instances of close relationship between fossil and Recent species of birds of the same genus the fossil form is larger.—HARVEY I. FISHER, *Department of Zoology, University of Illinois, Urbana, Illinois, January 4, 1952.*

Status of the California Gull Colony at Mono Lake, California.—Mono Lake, which lies just east of the Sierra Nevada in California, has for many years been the site of a large colony of the California Gull (*Larus californicus*). Dawson (Birds Calif., 1924:1398ff), who visited the lake in 1919, describes colonies on two islands in the lake, the north and south islands, but the latter has since been abandoned. In 1950 and 1951 I visited the colony on the north island to obtain some birds for life history studies of their parasites. The present colony occupies a restricted area, possibly 600 by 80 meters in extent, on the southeast side of the island. While I had not time for a careful census, I estimated the number of birds in the colony at about 1500. In an area of about 2000 square meters in the most populous part of the colony I counted some 40 nests. Dawson estimated the number of nests in the south colony only at 850, while Grinnell and Storer (Animal Life in the Yosemite, 1924:248) believed the total number of birds in this colony to be close to 1000 pairs. Nichols (Condor, 40, 1938:262) estimated the number of birds in the north colony at 3000, so it is evident that their number is decreasing. Why this is so is uncertain, as the gulls have no apparent enemies, with the possible exception of an occasional predatory bird, and there is nothing to disturb them on the nesting grounds at Mono Lake.

The food of the young birds is mainly the larvae and pupae of the brine fly (*Ephydra*), but some fish remains were found, and judging from the numerous tapeworms present, the brine shrimp (*Artemia*), which occurs in countless numbers in the lake, forms an added article of diet.

Grinnell and Storer (p. 250) state that the diet of the young gulls "consists exclusively of brine shrimp. Birds 3 or 4 days old had . . . a considerable number of these crustaceans in their stomachs" which they disgorge while the adults pour down similar disgorgements. I have had a similar unpleasant experience with the young but not with the old birds. In my own experience, however, these disgorgements apparently consisted entirely of fly pupae. Why there should have been a change in the food habits of these birds since Grinnell and Storer observed them is difficult to explain.

Behle (Condor, 37, 1935:24-35), writing of the bird colonies of Great Salt Lake, says (p. 28) "I have frequently seen flocks of gulls floating on the surface of the water feeding on brine shrimps." He mentions no stomach examinations to support his statement, and it is possible that the gulls were eating fly pupae, rather than shrimps, for I have similarly observed gulls on Mono Lake feeding, as I supposed, on shrimps only to find upon dissecting two of them that their stomachs were full of fly pupae.

The fish which the young birds had eaten must have been brought into the colony by the parent

birds, probably from a garbage dump on the lake shore, or possibly from nearby lakes in the mountains, as no fish live in the highly saline waters of the lake. In the laboratory the gulls evince little fondness for fly pupae after having been fed on fish and horse meat.

Both young and old gulls are extensively parasitized by a tapeworm (*Hymenolepis californicus*) which I have recently described (Jour. Paras., 36, 1950:9-12) and which is obtained from the brine shrimp as proven by feeding the latter to newly hatched birds. Every gull that was a few days old which I examined contained these worms. Even before leaving the nest the birds are occasionally infested.

In the laboratory the young gulls eagerly accept water, drinking and splashing in a basin which is quickly fouled by their excreta. Do the young gulls drink Mono Lake water? In the laboratory they refuse it, although they drink fresh water readily and sea water reluctantly. There is no fresh water available on their breeding grounds, so it is possible that they will drink lake water before they have become accustomed to fresh water. It is also possible that they obtain sufficient water from their food without drinking any.

This study was made in the course of parasitological research at the laboratory of the San Diego Zoological Society, to whom I am indebted for many courtesies.—R. T. YOUNG, *San Diego, California, January 2, 1952.*

Egg Laid by Killdeer Frightened from Nest.—The Killdeer (*Charadrius vociferus*) is an abundant breeding bird along the streams of the eastern slope of Mount Hamilton, Santa Clara County, California. On April 23, 1950, a pair of Killdeers on Arroyo Bayo, seven miles east of Mount Hamilton, gave alarm calls and ran slowly ahead as I approached. I watched the nearer bird with a 9 × 35 binocular from a distance of approximately 50 feet as it moved slowly away and stopped. The anal region was noticeably distended and the circumanal feathers were spread. As I watched, an egg emerged from the bird's cloaca and dropped to the ground. The bird paused for a few seconds, then ran on without even looking at the egg. I watched the bird for a minute longer, then picked up the egg which was still wet. The egg was dropped at 9:25 a.m. Apparently the female Killdeer had been sitting on the nest site and was nearly ready to lay when I frightened her. A careful search for the nest site was made but it was not located.—CHARLES G. SIBLEY, *San Jose State College, San Jose, California, January 15, 1952.*

Notes on the Sexual Behavior of Two Falcons.—On March 12, 1949, at the west end of the University of California campus, Berkeley, California, at approximately 11 a.m., five Sparrow Hawks (*Falco sparverius*) were seen in the air around the American Trust Building, the tallest building in the city of Berkeley. A quarter of a mile away two other Sparrow Hawks were active. The first group milled about and occasionally members of it landed on a sign on top of the building. Copulation was seen to take place suddenly between two members of the first group. A third bird flew in, causing the male to depart, and then copulated with the same female. This activity was repeated twice so that there was no doubt that two males were attending one female. Observation of this group was not continued.

At the same time the other pair of birds was active in sexual display. The male performed a vigorous diving flight, calling loudly almost continuously. Shortly afterwards this pair was seen copulating on top of a high flag pole. The nest of the pair was found nearby in a broken cornice of a three-story apartment house. Many times during the following week these birds were seen in copulation on various high structures in the vicinity of the nest. Throughout the next few weeks the female was seen in the nest hole. Once when the nest was approached, the female flew out calling and landed on a telephone wire across the street. The male responded by flying to her, and copulation took place. Shortly after sunrise at 6:10 on March 20 this pair was seen in copulation. In view of this activity it was surprising that eggs were not found in the nest until six weeks after the first copulation was recorded.

Although the incubation period and fledging time were not determined, the young were observed to be dependent on the adults and remained in the adults' territory until early September. After fledging the young moved to a tall eucalyptus tree on the University grounds where they could be heard calling almost continuously from dawn to dusk.

In the spring of 1948 the senior author was a member of a field party in the Mexican highlands. On February 23, 1948, near El Mante, San Luis Potosí, two Bat Falcons (*Falco albigularis*) were