

each. I drilled them, removed the shell and membranes, and fitted them with short lengths of $\frac{1}{8}$ inch copper tubing. The eggs were painted by dipping in interior wall finish (Dean and Barry Company White Alkyd Flat). The measurements of two of these eggs are shown in Table 1.

TABLE 1
MEASUREMENTS OF TWO EGGS WHICH WERE COPPER PLATED

<i>Measurement</i>	<i>Egg A</i>	<i>Egg B</i>
Weight (g)		
Fresh	9.0	8.0
Copper plated, shell removed	8.5	7.8
Plated, shell removed, copper tubing attached	11.7	10.7
Plated, shell removed, tubing attached, painted	12.3	11.1
Length (mm)		
Fresh	29.6	28.0
Copper plated	30.0	28.6
Width (mm)		
Fresh	23.6	22.8
Copper plated	25.0	24.0
Plated and painted	25.0	24.2

The weights of the copper-plated eggs, after the shells and shell membranes were removed, nearly equaled the weights of the fresh eggs. Larger eggs have a reduced ratio of platable surface to fresh weight, but at the same time require a thicker plating for satisfactory stability. Exact duplication of fresh weight is not normally necessary, since there is considerable variation in fresh egg weights and a progressive weight loss during the course of incubation. The copper models are much sturdier than natural eggs.

Although many investigations using artificial eggs do not require that the eggs be hollow or metallic, construction of the eggs by copper-plating should be among the simplest of methods for preserving accurate size and shape while maintaining reasonably accurate weight.—EDWIN C. FRANKS, *Department of Zoology and Entomology, The Ohio State University, Columbus, Ohio*; present address, *Department of Zoology, The Pennsylvania State University, University Park, Pennsylvania*.

Notes on breeding of the Common Nighthawk in Panama.—The taking in Panama on 7 May 1961 of a Common Nighthawk (*Chordeiles minor*), which was brooding a single downy young, established that this species, essentially one of temperate North America, breeds far south into the tropics, where it had generally been regarded as a migrant only. This formed the chief basis for the description of the subspecies *panamensis* (E. Eisenmann, *Amer. Mus. Nat. Hist., Novit.* no. 2094, 1962). Recently, on 12 May 1963, Olson took a female incubating two eggs containing fairly well developed embryos, on a hill on the outskirts of the city of Panama, four miles east of Albrook Field. This is about 20 miles east of Cerro Campana, where the specimen had been taken in 1961, thus bringing the breeding range nearer to South America. The eggs, the first known of this southernmost population, measure 30.5×22.0 and 29.2×21.6 mm, have a creamy white or pale buff ground color, and are densely and uniformly speckled with fine ochraceous brown and gray markings; the larger egg is somewhat more finely marked. Judging

by specimens in the egg collection in the American Museum of Natural History, and the comments in Bent (*U. S. Natl. Mus., Bull.* 176: 212, 236, 238, 1940), this uniform egg marking is more common in *C. m. chapmani*, the subspecies of the southeastern United States, than in the northern, nominate subspecies, *minor*. It is usual, however, in the western *henryi*, in which the rufescent color of adults somewhat resembles the much smaller and darker *panamensis*. The smaller eggs of the Lesser Nighthawk (*C. acutipennis*) also often show a similar pattern. This kind of egg marking probably has a cryptic value when eggs are laid on a bare, uniformly colored surface. The eggs collected by Olson were on a bare, red clay hill. Judging from the measurements given by Bent (*op. cit.*), these eggs fall within the range of size variation for all the races of *C. minor* mentioned, but are larger than the average (28.86×21.23 mm) for eggs of the similar-sized *chapmani*. On 23 May 1963 Olson also collected a male Common Nighthawk at the same locality in Panama. In this area, Olson, accompanied by Harvey Fischer, saw and collected, either on the same night or within a few days of when the eggs were found, four other species of Caprimulgiformes: Rufous Nightjar (*Caprimulgus rufus*), White-tailed Nightjar (*Caprimulgus cayennensis*), Pauraque (*Nyctidromus albicollis*), and Common Potoo (*Nyctibius griseus*).

The two nighthawk specimens agree well with the characters of *Chordeiles minor panamensis* in their relatively small size, reduced white wing band, and blackish dorsal surface with distinct rufous speckling. The incubating female measures: wing, 180 mm; tail, 94.5 mm; white wing patch on inner web of tenth primary, 8 mm (this patch tapers from the edge towards the shaft, which it fails to reach by at least 2 mm). The male is more blackish above than the female, with narrower and reduced rufous speckling, is less tawny below, and measures: wing, 182 mm; tail, ca. 103 mm (since one of the middle rectrices is missing, there is some uncertainty as to the exact upper point of insertion of the calipers, thus the tail measurement may be a bit too long). The white wing band reaches to, but does not include, the shaft of the outermost primary, being restricted to the inner web, and measures 12.5 mm at its widest point. The white tail band extends over both webs of the outer rectrices, but is much narrower on the outer webs. In this male the testes were not enlarged and the bird was very fat, suggesting that it might have been a migrant despite the late date and its presence at a breeding locality. However, it agrees in all features with Common Nighthawks of the race *panamensis*, which are thought to be migratory to South America, and which probably have a breeding range extending north into southern Central America (see Eisenmann, *op. cit.*). It is also possible that some birds breeding in Panama may reach reproductive condition late in the season.

The few reports of "booming" by nighthawks in Panama have been for April; thus, they tie in with the two definite nesting records in May, since "booming" is usually associated with the period of courtship and the beginning of incubation. Eisenmann and Edwin O. Willis on 23 June 1964 saw a nighthawk repeatedly give its diving boom near dusk over Cerro Azul, east of Panama city. Many other individuals seen on that evening in the same locality, and elsewhere in the vicinity, merely gave the usual nasal call. Eisenmann, who has been in Panama on many occasions during June and July in areas where nighthawks were commonly seen and heard, had never previously noted the diving boom there.

We are indebted to Dr. Wesley Lanyon for aid in measuring the specimens, which are now in the collection of the American Museum of Natural History.—STORRS L. OLSON, *Florida State University, Tallahassee, Florida*, and EUGENE EISENMANN, *American Museum of Natural History, New York, New York*.