



Figure 1. Eggs of the Puna Plover.

The nesting place of the Puna Plover was a grassy plain about 165 feet from a large salty lagoon at an altitude of about 13,000 feet. The eggs were clearly visible as the stiff grass had been extensively grazed on by llamas. There were many areas of exposed sand and mud in the vicinity, indicating that these plovers prefer grassy ground for nesting, unlike many other small plovers which nest on sandy or stony ground. The bird incubating the eggs described below was very shy and disappeared at my approach. An immature bird was collected and contained remains of a single crustacean.

Two eggs were obtained (Figure 1); both are similar to those of other small plovers. The ground color is sandy with a wash of brown, marked with fine spots of violet and spots and streaks of black. The edges of the black markings are sharp. The eggs measure 34.8×24.7 mm and 34.9×24.2 mm.—GUNNAR HOY, *Museo Zoologico de la Facultad de Ciencias Exactas, Fisicas y Naturales, Universidad Nacional de Córdoba, Argentina.*

“Resting” heart and respiratory rates of small birds.—The data presented in Table 1 were recorded in August, 1962, under the auspices of the Department of Biological Sciences, Douglass College, Rutgers University. Birds were obtained by mist-netting near New Brunswick, New Jersey. Electrocardiograms were taken on the day of capture on a specially adapted Sanborn Viso-Cardiette and subjects then released without determination of sex. Age was established on the basis of plumage.

Small nickel-plated pins were used as electrodes, one being placed through the integument over the synsacrum and the other through the posterior margin of the sternum. With this arrangement a composite recording of heart and respiratory rates could be obtained. Furthermore, these records reflected even slight somatic motor activity. No distress was noted among subjects, the electrodes being generally preened into the plumage or otherwise “ignored.” Recording was remote by virtue of small wire leads (#30 Alpha wire) which were run into another room. Prior to recording, a

TABLE 1
"RESTING" HEART AND RESPIRATORY RATES OF SMALL BIRDS

<i>Species</i>	<i>Age class</i> ¹	<i>Weight</i> (gm)	<i>Ambient</i> <i>temper-</i> <i>ature</i> (°C)	<i>Heart</i> <i>rate</i> (beats/ min)	<i>Respira-</i> <i>tory rate</i> (cycles/ min)
<i>Colaptes auratus</i> (Yellow-shafted Flicker)	immature ²	109.7	27.3	262	37
"	immature ²	114.4	20.4	197	15
<i>Empidonax flaviventris</i> (Yellow-bellied Flycatcher)	first autumn	10.2	27.4	545	74
<i>Cyanocitta cristata</i> (Blue Jay)	first autumn	77.1	22.5	307	49
<i>Dumetella carolinensis</i> (Catbird)	first autumn	30.2	27.3	552	84
"	juvenal	28.5	25.4	264	29
"	first autumn	28.1	20.2	465	7 ³
<i>Toxostoma rufum</i> (Brown Thrasher)	adult	59.2	23.9	303	30
<i>Turdus migratorius</i> (Robin)	first autumn	80.3	20.9	332	44
"	first autumn	71.3	20.8	384	40
"	juvenal	69.7	27.4	347	48
"	juvenal	67.0	22.2	311	33
"	juvenal	65.1	23.5	327	30
"	juvenal	63.8	22.2	265	24
<i>Hylocichla mustelina</i> (Wood Thrush)	adult	30.5	27.5	363	43

¹ Based on plumages (see J. Dwight, Jr., *Ann. New York Acad. Sci.*, 13: 73-360, 1900; T. S. Roberts, *The birds of Minnesota*, Vol. 2, Minneapolis, Univ. of Minnesota Press, 1932).

² Postjuvenal molt in progress; malar stripes present.

³ Amplitude of respiratory trace too low to allow reliable reading.

subject was placed on a perch and allowed to remain in the dark for 30 minutes or until no motor activity was evident. Recording continued until a continuous 15-minute period free of activity was observed. Rates presented in Table 1 represent mean rates for this period. Heart rates reported agree well with those reported by E. P. Odum (*Wilson Bull.*, 55: 178-191, 1943; *Science*, 101: 153-154, 1945) for several species of small birds.

Inspection of the electrocardiograms revealed that even slight somatic motor activity was associated with cardioacceleration, the degree of acceleration being at least roughly proportional to the duration and "intensity" of motor activity as indicated by the observed increase in gain of the recorder. Increased breathing rate often accompanied motor activity. Furthermore, individual records were consonant with Odum's conclusion (Odum, 1945; see above) that heart rate generally decreases somewhat at the peak of inspiration and increases "between breathing cycles."—R. ALAN LEWIS, *Avian Physiology Laboratory, Department of Zoology, University of Washington, Seattle, Washington.*