Sparrow rubbed the side of its bill down the tarsus from the tarsal joint to the toes, where the motion ended. This was repeated on the other leg except that the motion ended at the band. Whether or not the band was partially responsible for stimulating the oiling motions cannot be ascertained, but several other Fox Sparrows banded the same day did not anoint the tarsi while preening. During the motion, the bird did not raise its leg from the limb, but instead bent its head down to oil the tarsi. The second occurrence, where only one leg was oiled, took place after the bird had preened down the breast, and the two motions nearly blended. This motion also stopped at the toes.

Mrs. Whitaker (*op. cit.*) described carefully the manner in which her captive Lark Sparrow performed these motions, and also reported that Mrs. A. Nelson has seen tarsal oiling by a captive House Sparrow (*Passer domesticus*). The behavior of my banded Fox Sparrow was similar to that of the Lark Sparrow in several respects: both birds rubbed the tarsi only while preening, both species performed bill wiping and shaking movements before but not during the oiling, and the sequence of motions after tarsal oiling ("usually starting by pulling at mid-breast feathers and then stropping remiges of either wing," Whitaker, *op. cit.*) was similar for both. There are, however, some differences. The Lark Sparrow thrust one foot forward in order to rub it, whereas my Fox Sparrow oiled the leg while still grasping the perch with both feet. Also, the Fox Sparrow did not oil its toes as the Lark Sparrow sometimes did. Certain relationships in sequence of movements in the Lark Sparrow did not hold true in the Fox Sparrow. For instance, the Lark Sparrow always bathed before oiling, which was not true of the Fox Sparrow, although a slight rain that was falling may have provided similar stimulus to the latter bird. Furthermore, tarsus oiling always came before breast preening in the Lark Sparrow, whereas the order of the two was variable in my Fox Sparrow. Finally, once preening of feathers began, the Lark Sparrow neither used the oil gland again nor rubbed the tarsus again, whereas the Fox Sparrow did both.

The significance of species differences in morphology and sequence of oiling and other maintenance activities cannot be evaluated from such short observations as these. Problems concerning the biological function of tarsal oiling and its possible connection with molt of tarsal scales are discussed by Whitaker (*op. cit.*) and nothing new can be added here. It is suggested that bird-banders who inspect their birds in the hand and watch them after release can contribute valuable information about this rare behavior trait.

I am indebted to Carl W. Helms for his help in the banding experiments, and to Dr. William H. Drury, Jr., Director of the Hatheway School of Conservation Education at Drumlin Farm for the use of a wire recorder and banding equipment which were used in the experiments.—JACK P. HAILMAN, *4401 Gladwyne Drive, Bethesda 14, Maryland, January 16, 1959.*

The taxonomy of the Robin in Mexico.—The taxonomic treatment accorded *Turdus migratorius* in the Mexican Check-List (Miller, *et al.*, 1957. *Pac. Coast Avifauna*, 33:1–436) was something of an innovation. However, no supporting data were presented. My own study generally confirms this arrangement and provides data. I studied 193 adult-plumaged Robins from Mexico, plus over 100 specimens of *T. m. propinquus* from western United States, and a few of each of the other races.

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ogy, and the United States National Museum courteously loaned me their Mexican Robins.

The chief size difference which has been claimed as differing geographically is wing length. The data in Table 1 suggest that even this is a poor character. There is a weakly-marked cline of wing length, decreasing from the southern Rocky Mountains southward through northwestern Mexico to the Transvolcanic Range in Jalisco, thence eastward, and culminating southward in Guerrero in the smallest population.

TABLE 1
WING LENGTH (IN MM.) OF ADULT MALE ROBINS

Race	Locality	Size of Sample	Range	Mean	Standard Deviation	Coefficient of Variability
propinquus	California and Nevada	25	130–139	135.0	2.74	2.03
"	Southern Arizona and Northern Sonora	11	132–139	136.9	1.75	1.28
"	Northeastern New Mexico and western Texas	12	134–144	138.1	3.27	2.37
"	Northwestern Chihuahua	10	137–145	140.2	2.12	1.51
"	Southwestern Chihuahua, Durango, and western Zacatecas	11	132–144	135.5	3.77	2.78
phillipsi	Jalisco and Michoacán	16	129–141	134.9	3.36	2.49
"	Nuevo Leon, Morelos, Oaxaca, and state of Mexico	5	129–139	134.4	—	—
"	Guerrero	41	130–138	133.9	2.45	1.86

Color shows a definite cline of increasing dorsal darkness and ventral brightness, from southwestern United States southeastward to southern Mexico. The most definite step in the material studied occurred at the Zacatecas–Jalisco border.

Sexual dimorphism in color is rather prominent in the Robin, but males from one population are sometimes similar to females from another population. Fall specimens in fresh plumage were the basis for the statements on color made herein; however, carefully sexed adults in worn plumage could be identified.

The two races breeding in Mexico are:

Turdus migratorius propinquus Ridgway

Turdus propinquus R. Ridgway, *Bull. Nuttall Orn. Club*, 2:9, 1877 (Laramie Peak, Wyoming).

Lacking the white tail corners of *migratorius*, *achrusterus*, and *nigrideus*; paler throughout and less reddish ventrally than *caurinus*; as compared with *phillipsi*, paler dorsally, less bright-ochraceous and either redder or duller ventrally, averaging less blackish on the throat, and with more white flecks ventrally.

There is considerable variation within the range of *propinquus*. The populations of the southern Rocky Mountains and northwestern Mexico are grayer, less brownish dorsally than those of California, Oregon, and Nevada; as well as paler, less reddish, ventrally. Certain specimens from the southern Sierra Madre Occidental, in Zacatecas and southern Durango, approach *phillipsi* in brightness of the ventral ochraceous.

Range: (based on specimens examined) Breeding in western United States, and mountains of northwestern Mexico south to southern Durango and western Zacatecas. South in winter as far as Guerrero and state of Mexico.

Turdus migratorius phillipsi Bangs

Turdus migratorius phillipsi O. Bangs, *Proc. Biol. Soc. Wash.*, 37:125, 1915 (Las Vigas, Vera Cruz).

Similar to *propinquus*, but darker and often browner dorsally; a brighter hue of ochraceous and often less reddish ventrally; averaging blacker on the throat; and with fewer white flecks ventrally. As compared with *caurinus*, more ochraceous, less ruddy ventrally.

The population of Jalisco and Michoacán approaches *propinquus* in that it averages paler dorsally and duller ventrally than that of eastern Mexico and Guerrero. A few of the specimens from eastern Mexico (Hidalgo, Vera Cruz, etc.) are perhaps slightly ruddier, less ochraceous ventrally than any comparable ones from southwestern Mexico (Guerrero), but the tendency is difficult to discern and in my opinion does not even approach the order of a subspecific distinction. In other words, I regard *T. m. permixtus* Griscom as a synonym of *phillipsi.*

Range: (based on specimens examined) Resident from Jalisco, Michoacán, and Nuevo Leon south to Guerrero and Oaxaca.

Mexican Specimens Examined.—Sixteen specimens are unidentifiable to race because of lack of sexing, or questionable sexing, in conjunction with worn plumage. Spotted juveniles are not included. Migrant and wintering specimens are included.

T. m. migratorius—Yucatán 1, Vera Cruz 1, Nuevo Leon 2.

T. m. propinquus—Guerrero 6, Michoacán 1, state of Mexico 1, Guanajuato 1, Zacatecas 14, Durango 6, Chihuahua 13, Sonora 4.

T. m. phillipsi—Jalisco 17, Michoacán 11, Nuevo Leon 1, state of Mexico 3, Hidalgo 1, Federal District 1, Puebla 1, Vera Cruz 2, Oaxaca 1, Guerrero 76.

J. DAN WEBSTER, *Hanover College, Hanover, Indiana,* and *California Academy of Sciences, San Francisco, February 27, 1959.*

Octaves and kilocycles in bird songs.—In recent years physicists have discovered a means of recording sounds in visible marks. This is by machines such as the audiospectrograph (Kellogg and Stein, 1953) and the vibralyzer (Borror and Reese, 1953). The markings produced in this way are similar to those that I have made representing sounds heard by ear, in that time is represented horizontally and pitch vertically. There are other differences, however, that need explanation so that we may understand both kinds of records.

In the mechanical records pitch is measured in kilocycles. When I first studied the physics of sound the term used was vibration. Brand (1935) used the term frequency. Although technically different terms, cycle, vibration, and frequency have been used by different authors to represent the same attribute of bird song.

In the methods I have used in recording bird songs the pitch is measured in octaves. The octave differs from the kilocycle in that each octave contains twice as many cycles as the previous one (or half as many as the following one). To put it mathematically, in the kilocycle the cycles increase in an arithmetical progression, but in the octave in a geometrical progression. Therefore, the first kilocycle, from 0 to 1000 cycles, begins below the limit of man's hearing and contains all of the octaves up to just below C_5, as Brand (1935) designates it. This is C″ in the method I (1951) used in the Guide to Bird Songs. C″ contains 1024 cycles. The next kilocycle is almost coincident with the next octave, which extends from 1024 to 2048 cycles. After that, the two octaves from C‴ to C′′′′′, the place where the songs of most of small bird singers are pitched, contains no less than six kilocycles.