stimulus is presented the response is not immediate, but builds up over a period of time . . . . a brief stimulus must be more intense in order to appear equal to a longer stimulus."

The duration of these three pulses of sound and the intervals between them were studied. The first pulse is about 0.011 seconds long. During this time the frequency rises about two notes of an octave and drops about one note. After an interval of about 0.047 seconds, there is the second pulse of sound of about 0.092 seconds duration. This is modulated in two steps wherein the sound rises about two notes, drops one, and then rises about one note. After an interval of about 0.14 seconds, the third and final element of the bird's call is given. This begins at about a note lower than the previous, and is frequently modulated up the scale to about the sixth or seventh step, then drops off about three notes. This is approximately 0.67 seconds long. The time interval between calls is approximately 0.34 seconds.

It is difficult to interpret the aural response to the Whip-poor-will call. The word "whip-poor-will" spoken into an oscilloscope shows not even a remote resemblance to the trace produced by the bird's call. Cleaves (Auk, 62: 304–305, 1945) states that the Whip-poor-will says *purple-rib*. In general, the amplitude modulation coupled with the frequency modulation, and together with the preliminary pulses of sound over short intervals, establishes the characteristic of the call of this bird. Obviously the ear does not comprehend all of its elements, but gains an impression which is an ear-limited composite. The variation in the amplitude plays an important rôle in the psycho-acoustic affect on the human listener. The first note is of very short duration and is of an amplitude about a fifth of the greatest amplitude in the call. The greater portion of the second note has an amplitude which approaches the maximum for the whole call. The third portion of the call starts at an amplitude lower than the major part of the second note, increases rapidly toward the end, and then drops off rapidly. There are approximately 59 calls per minute, sometimes repeated for 15 minutes or longer. Cleaves reports hearing the bird call continuously for more than 1000 calls.

There appears to be the impression among numerous individuals who have had some musical training that the sounds of nature, and particularly of birds and insects, have numerous harmonics. Except for a few birds such as geese, ducks, and quail, the "tones" produced are usually free from harmonics at least in the audible range. Mrs. Wing (Auk, 68: 189–193, 1951) in her fine work on the variations in the song of the Hermit Thrush indicates the presence of harmonics. It is possible that this bird does sing a fundamental with one or more audible harmonics; it is more likely that two or more short pulses of notes in sequence separated by short intervals are interpreted as being simultaneous and therefore harmonic. In a recording of the Eastern Hermit Thrush by Jerry Stillwell no harmonics were visible on the oscilloscope. The calls of the majority of our song birds produce typical sine waves which, however, are frequency modulated, and on the oscilloscope they show considerable amplitude modulation which makes partial envelopes of sound.

This study was carried out with aid from the University of Utah Research Fund.—STANLEY MULAIK, WILLIS LEE, AND JERRY E. STILLWELL, *Division of Biology, University of Utah, Salt Lake City, Utah.*

The Nest of the Long-billed Gnatwren (*Ramphocaenus rufiventris*).—The affinities of the neotropical genus *Ramphocaenus* have been in doubt. Formerly regarded as belonging to the sub-oscine antbird family, Formicariidae (Ridgway, U. S. Natl. Mus. Bull., 50 [5]: 14, 1911), this genus is now considered to be truly oscine and is allocated to the same subfamily as the gnatcatchers (*Polioptila*) (Wetmore,

Proc. U. S. Natl. Mus., 93: 306, 1943; Mayr, Auk, 63: 67, 1946). While differing strikingly in voice, brown color pattern, and long bill, *Ramphocaenus* does resemble *Polioptila* in being a thicket dweller, in its slender build, and in the nervous twitching of its tail, which usually is carried erect. Though *Ramphocaenus* ranges from tropical Mexico southward, no description of the nest of any form of the genus has apparently been published. On July 15, 1950, I found a nest of *R. rufiventris* in the Juan Franco suburb of the city of Panama, Panama. This area consists chiefly of open country, but the nest was in a damp thicket, about 15 feet from a narrow stream used as a drainage ditch, which was well shaded by a growth of fair sized trees. The nest was an open cup built among the vertical shoots of a small shrub, about six inches off the ground. It was composed chiefly of grass-stems, with a few twigs and dried leaves, and to the exterior were attached several large dried leaves that hung loosely along the sides and extended below the nest proper, forming a sort of ornamental skirt. Measurements: exterior diameter, 4 inches; interior diameter, 3 inches; exterior depth, 5 inches; interior depth, 3 inches. The nest contained two almost naked young, apparently a few days old. It was discovered by watching an adult carrying an insect to the nest.

Dr. Alexander F. Skutch writes me that he found a somewhat similar nest in Costa Rica in 1939; the two eggs were laid on April 14 and 15. Skutch also reported that the incubation period was 17 days, the nestling period, 12 days (Auk, 62: 21, 1945). Dr. Skutch also tells me that when hatched, the young are completely devoid of down, and that both parents incubate and care for the nestlings.—EUGENE EISENMANN, *11 Broadway, New York 4, New York.*

Notes on the Yellow Warbler in Surinam.—The Yellow Warbler (*Dendroica petechia*) is a common winter visitor in Surinam. According to Zimmer (Amer. Mus. Novit. No. 1428, 1949: 5), only the race *aestiva* has been taken there, but the race *brewsteri* probably also occurs there since it has been found in both British and French Guianas. The earliest known arrival date, August 28, 1921, was recorded by the late Thomas E. Penard (Auk, 44, 1927: 425). The Penard brothers earlier (De Vogels van Guayana, Vol. II, 1910: 483) gave a series of six arrival dates (September 10, 6, 7, 17, 16, and 3) but did not mention the respective years. I have been unable to find any published information on the date of departure for the breeding grounds. My records of the dates of arrival and departure are as follows:

Season	*First Seen*	*Last Seen*
1945–1946	—	March 17
1946–1947	September 17	March 29
1947–1948	September 22	April 8
1948–1949	September 1	March 25
1949–1950	September 6	April 10
1950–1951	September 4	March 28
1951–1952	September 3	April 5
1952–1953	September 8	April 13

In Surinam, the Yellow Warbler is one of the most striking of the northern migrants and is found in trees and shrubbery in the smallest gardens and back yards of Paramaribo. I do not agree with Penard that it is a shy bird, and it certainly does not confine itself to the tree tops. When foraging, Yellow Warblers frequently utter their call note, a characteristic "chip," by which their presence is first noticed each year. Having never been in the breeding haunts of this species, I do not know its song,