

SHORT COMMUNICATIONS

Displays of the Vermilion Flycatcher (*Pyrocephalus rubinus*).—In a recent note (Condor, 68:306–307, 1966) DeBenedictis provided descriptions of display flights of the Vermilion Flycatcher seen in southeastern California and on the Galápagos Island of Santa Cruz. Noting certain differences in the observed flights, he suggested that a separate binomial (*P. nana*) be retained for the Galápagos population. The sample size on which his suggestion is based is small: three flights (two not seen in detail) in southeastern California, and two days of observations on Santa Cruz yielding repeated displays of several birds.

DeBenedictis reports four main differences between the displays observed in California and on Santa Cruz. (1) Santa Cruz birds used a “rapid but shallow” wing motion, extending the wings up to about 45° above horizontal only at the apex of each undulation, while California flights (two in heavy wind) were marked by a “slow and deep and continuous” wing beat in which the wings extended conspicuously above (although not below) the body axis. (2) After each successive apex in a flight the Galápagos individuals glided briefly whereas the California individuals glided only during the terminal portion of the flight. (3) Near the apex of each undulation Galápagos birds uttered a *chew wit* but Californian birds repeated a quite different, “strident, whistled *pt pt pre-ee-eeen*” several times within a display flight. (4) On or about the first wing stroke after the glides in the Galápagos flights there occurred a “sharp mechanical snap”; Californian birds lacked this. On the basis of a single observation from mainland Ecuador, plus personal communication about Colombian individuals from A. H. Miller, DeBenedictis cautiously suggested that the flight displays of different mainland populations may be more similar to one another than to the display of the Santa Cruz population.

DeBenedictis' descriptions add useful details to the little that is known of the display behavior of the Vermilion Flycatcher, and possibly the different features he saw in the Galápagos population are peculiar to it. However, it is at least as likely that they are not. Further, even if some features of this complex display should be shown to be restricted to that isolated population, it is unlikely that a specific name should be set aside unless the differences with other populations are much more marked than his observations seem to indicate. To broaden our basis for comparison, I should like to add observations which suggest that the display of the Santa Cruz birds may be little different from that of at least one mainland population.

I have observed displaying Vermilion Flycatchers on three occasions in coastal and Andean Ecuador, and during one season in southeastern and south-central Arizona, but have made notes on display flights in only the latter area. I have never given the species as much attention as it requires, since it appears to display relatively little, and a great deal of time would be needed to complete a study of communication in any of the birds I have encountered. My notes cover somewhat over 20 display flights, including instances in which several flights seen within one observation period were similar and given only one description. In the most complete (or most complex) of these a bird would fly up from his perch to a height of about 40 feet, level off and flutter forward in either a straight or a curved path. Every few feet he would rise slightly and stall or almost stall, then continue forward. Each stall was marked by a strong upward stroke of the wings, and a pronounced arching of the bird's axis in which the head was pulled back between the shoulders and the tail elevated at least slightly above the horizontal. Wing beats ceased briefly at each stall as the bird pitched forward to its former level, but I did not see this extended into a glide. The wing beat between stalls was rapid and shallow, with the wings kept above the back (although not as high as they were during the stalls). After several stalls the bird usually completed the display flight by dropping to a perch in a series of swooping glides, often with the tail cocked high. Most of the stalls came within the period of level flight after the initial climb, but one or more sometimes occurred while climbing. In one case stalls occurred only during the climbing phase, and the bird apparently terminated the flight when he reached a treetop perch (on the side of the tree I could not see). The feathers of the chest and apparently of the crown are ruffled during at least the stalls.

Vocalizations occurred in most but not all flights. In all but one case (see below) these calls were identical or closely similar to the Regularly Repeated Vocalization for which I have tape

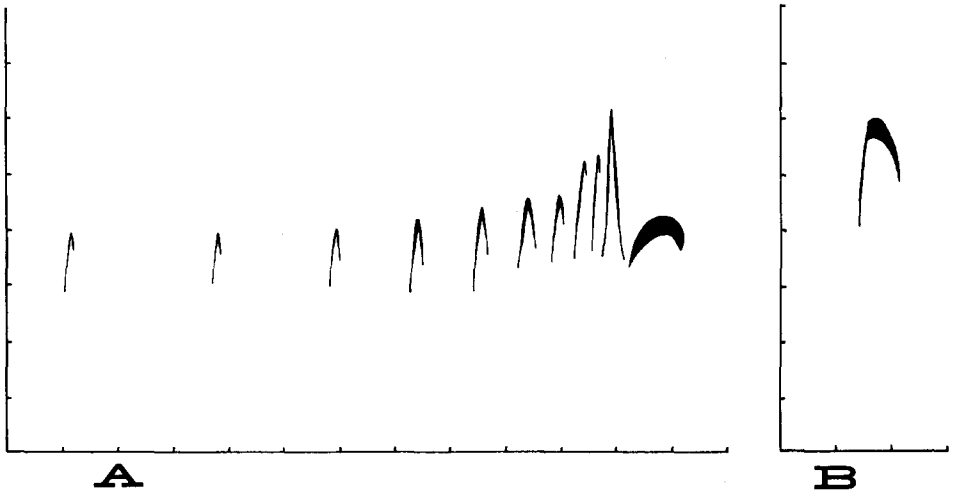


Figure 1. A. Regularly Repeated Vocalization. B. The *peent* vocalization. Each interval on the abscissa is 0.1 seconds, on the ordinate 1 kilocycle per second.

recordings (no recordings of flight display calls were obtained). In the field I described this vocalization as *t-t-ti-ti-tee-teeur* (fig. 1) and feel from listening again to my recordings that DeBenedictis' description (*pt pt pre-ee-eeen*) is probably of a vocalization closely similar to this. (Our alphabet is a very poor tool for describing bird sounds, and descriptions as different as mine and that of DeBenedictis are often made for one and the same sound; this problem is discussed in detail by Thorpe and Lade, *Ibis*, 103a:231-245, 1961.) This call was usually given just as a bird rose into each stall. Birds which did not call in some of their flights usually did stall, but on one occasion a bird called in the ascending portion of the flight (this call may have lacked the introductory units) and was silent while fluttering in level flight; in this flight he did not stall. One flight display was seen where an immature male performed normally except that his call was high and clear, apparently bisyllabic, and short; I made no attempt in my notes at an onomatopoeic description.

A comparison of the various displays I have seen with DeBenedictis' list of differences between the Santa Cruz population and his other observations indicates that at least some of these differences could be due to sampling error. My Arizona birds, for instance, flew with the wing beat typical of the Santa Cruz birds rather than that reported from the three California flights. The Arizona birds did not glide after each stall, but as they pitched forward there was a very brief period in which they did not flutter either, so that they were in some sense intermediate between the two possibilities reported by DeBenedictis. The Arizona birds uttered a vocalization much more like that of the California birds than like that of the Santa Cruz birds, but one individual Arizonian was exceptional and apparently more like the Santa Cruz birds. This was an immature male (not in full plumage); the Santa Cruz birds were in the "early" part of their breeding season—perhaps in both cases the vocalization being used was not typical of that of the most complex form of the display flight. Finally, the mechanical snap produced by the Santa Cruz birds was not produced by either the Californian or the Arizonian birds (although I have heard an Arizonian male make a sound with his wings in another situation—see below). This may well be a real difference, although I am cautious in accepting such a conclusion since some of the kingbird species I have studied produce a Wing Whirr in most (but not all) of their comparable flight displays. In summary, of the four possible differences between the Santa Cruz population and mainland populations, observations of birds in Arizona suggest that one may be a consistent difference (the

mechanical noise) and one other (the call) may also be, but an alternative possibility must be excluded before this can be accepted.

My sample is large enough to illustrate that each male has a range of variation in different aspects of the flight, but is probably not large enough to indicate the whole range of this variation. A sample of three flights would be even less adequate—in fact, I have at least once seen three consecutive flights that were fully silent. Further, it is difficult to estimate the amount of inter-individual variation; the most aberrant set of calls, for instance, was uttered by an immature male, the only one I've seen give this display. It is not known if immatures, or mature males not fully into breeding condition, call differently from fully adult males at the seasonal peak of usage of the display.

The occurrence of intra-individual variation in flight displays of tyrannids is scarcely surprising, as these are on the whole very complex displays with many components. Through an extended comparative study of tyrannid displays I have become to different degrees familiar with flight displays in several genera, including *Pyrocephalus*, *Tyrannus*, *Muscisaxicola*, *Hymenops*, *Knipolegus*, *Sayornis*, *Contopus*, *Empidonax*, and others. Whenever I have seen more than a few instances of the display in any one species (or, usually, in any one individual), I have found it to be variable. Usually there is a most complex form, and this may be the most common form at the right season within a suitably dense population. In less-dense populations, or at unfavorable seasons or unfavorable times of day, components may be omitted, or even altered. In the *Tyrannus* species with which I am most familiar (Smith, Nuttall Ornithol. Club Publ., 6:1-250, 1966), the vocalization is at least rarely independent of the flight display to the extent that a different unit of the vocal repertoire may occasionally be used.

Comparisons of behavioral features of geographically distant populations can be made difficult by the impracticality of being in the right place at the right time to get adequate samples. Nonetheless, it is an important task, and we need to know much more about geographical variation in behavior. In criticizing DeBenedictis' tentative conclusions, I do not wish to appear to criticize either his intent or his observations, but merely to point out that the caution he showed was justified—particularly so in the light of his small mainland samples. His note does add considerably to our knowledge of the displays of *Pyrocephalus rubinus*, and I should like to offer an extension of that information by appending hereto a summary of the remainder of the display repertoire of this interesting species.

Regularly Repeated Vocalization (RRV). The same call which was uttered in flight displays in Arizona was also given from perches (DeBenedictis noted this in California). It is repeated rapidly and fairly regularly for many minutes by each territorial male during at least part of the breeding season. This usage is almost restricted to the predawn twilight; hence it is one of those calls which are often popularly called "dawn songs" in the Tyrannidae. The same vocalization is sometimes repeated in the evening twilight when two or more males countercall, however, and is repeated in flight displays at any time of day. Marchant (Ibis, 102:370, 1960) reports that "singing" is common at night in southwestern Ecuador. I have called it the RRV in order (1) to avoid the impression that it is restricted to predawn calling, and (2) to make its name consistent with the one I am applying to closely comparable displays in other tyrannids.

The form typical of the RRV in my experience is shown in figure 1A. In the field I have detected no obvious differences in this display among many individuals in Arizona, and none in the usage of any one individual, except for small differences in the number of introductory "t" elements and in the length of the brief intervals between them. A tape-recorded sample of 28 repetitions from one individual in the predawn twilight and of six repetitions from two individuals in the evening twilight shows very little variation, other than a tendency to use relatively short introductory series and to group the repetitions into couplets in the evening.

"Peent" Vocalization. At any time of day, the call one is most likely to hear from a Vermilion Flycatcher is a sharp, and usually loud, *peent* (fig. 1B; there are slight variations in duration, frequency, and sharpness of peak within individual usage, but the form is essentially the same in recordings from both Ecuador and Arizona). In my experience in both regions even this is not a common vocalization, and birds, even when obviously associating in pairs, are likely to be silent

for long periods of time. When foraging very actively, however, individuals of either sex may use this call. Both may also utter it while an observer is approaching their nest, or when they are at least slightly aggressive and chasing other birds of their own and other species. I have seen two males approach one another, both repeating *peent*, and then gradually drift apart, calling less, without having had an encounter. One male, perched on station while his mate was apparently incubating, usually did not call, but on becoming "nervous" (changing perch relatively often, Tail Flicking, peering around more) and more aggressive (he attacked a male *Muscisaxicola maculirostris* which he usually ignored), he began to repeat *peent* every 10 to 20 or so seconds. Steinbacher (Avicul. Mag., 58:196-198, 1952b) reports a call, apparently this one, as used by an aggressive caged male during attacks on his mate. On the whole, the call either indicates that the communicator is relatively aggressive or is at least relatively active. It may correspond in large degree to the Repeated Vocalization in the genus *Tyrannus* (Smith, *loc. cit.*) but this is not yet clear.

Other Vocalizations. I have heard no other calls from Vermilion Flycatchers, but Steinbacher (*loc. cit.*) gives a description of aggressive and sexual encounters by a caged male toward his mate in which the mate often uttered "somewhat complaining calls." These are probably the ones he at one point describes as *tjee-tjee-tjee* and must be distinct from the *peent* as he describes another call, used by the male, which is likely to be that display. The female's calls were apparently restricted to instances in which she was being attacked or in which she appeared to be inviting copulation.

Plumage Ruffling. I have already mentioned that the feathers of the chest and probably the head are ruffled during the stalls in a flight display. Ruffling of the crown feathers is fairly common—some birds show it even when flycatching. Both the males I watched advance toward one another ruffled and spread laterally their crowns, and a male who usually called as I approached his mate's nest kept his crown ruffled while calling *peent*. Steinbacher (Avicul. Mag., 58:83-86, 1952a) reports that his aggressive captive male frequently ruffled his crown.

Tail Flicking. In both Arizona and Ecuador individuals of both sexes often flicked their tails—a quick downward movement followed by a relatively slower upward return. This is an almost inevitable accompaniment of landing from a flycatching flight, and if the bird is particularly active and flying a lot there are likely to be several Tail Flicks in rapid succession. During the last one or two of such a series the tail is likely to become half-fanned. Birds not just returned from a flight also Tail Flick from their perches if they are being more active than usual. This often corresponds with periods of *peent* calling, but the Tail Flicks are simultaneous with only some of the calls.

Wing Flirting. An active individual which is Tail Flicking frequently and in series may often flirt its wings with one or more of the tail movements. This usually follows a landing. The movement is a brief, small-amplitude jerk of both wing tips slightly outward and forward.

Wing Whirr. Although *Pyrocephalus* does not have a specialized primary feather, it is capable of making a sound with its wings in flight. This probably corresponds to the Wing Whirr I have described in the genus *Tyrannus* and noted in other tyrannid and non-tyrannid birds which use it in agonistic situations. I do not fully understand its usage in any species, and have heard and tape recorded it only once in the Vermilion Flycatcher. A male, disturbed as I approached his nest, called *peent*, Tail Flicked and Wing Flirted considerably, and gave bursts of two to five mechanical rasping noises (each burst sounding like a whirr) when flying from perch to perch. This was not loud, but it may be related to the sound DeBenedictis heard in flight displays on Santa Cruz.

Gape and Bill Snap. Two displays which are widespread within the Tyrannidae are a lunging at an opponent with the mouth held open (Gape) and a loud snapping of the bill during attack. I have not noticed either in this species, but Steinbacher (1952b, *loc. cit.*) reports both from his aggressive caged male during attacks on its mate.

Nest-Site-Showing. Male tyrannids of some species perform nest-building movements alone or before a female. They do not handle material during this activity, and are usually not at the site where a nest is built (although they occasionally give the display when in the nest their

mate has built). Dawson (*in* Bent, U.S. Natl. Mus. Bull. 179, 1942) describes what seems to have been a display of this sort performed by a male Vermilion Flycatcher not near a female.

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Nests of the Common Bush-Tanager and the Scaled Antpitta.—A recent paper by J. Stuart Rowley (Proc. Western Found. Vert. Zool., Vol. 1, No. 3:107–204, 1966) includes a description of a partially completed and abandoned nest of the Common Bush-Tanager (*Chlorospingus ophthalmicus*), and indicates that there are still no published data concerning any occupied nest of this species.

I observed such a nest on 25 April 1956, placed on the ground on a high cut-bank along the highway about three miles east of the center of Villa Juárez, Puebla, México. At that time I verified the ownership of the nest by observing the Bush-Tanager as it entered the nest. On 2 May 1956 the nest contained three eggs, and the Bush-Tanager was again observed at the nest. The cut-bank was high, steep, rocky, and densely overgrown with small ferns, mosses, and grasses, with a very few small woody shrubs, and a rather large tree-fern high on the bank. Remnants of cloud forest were adjacent to the bank. The nest was about 25 feet above the level of the highway, and was a horizontal cup about 3.5 inches in outside diameter and about 2 inches in inside depth, situated among ferns and mosses, and nearly roofed over by naturally growing mosses. It was constructed largely of rootlets. The eggs were approximately 16 to 18 mm in length, and were white with many small spots of pale buffy-chestnut, the spots being more numerous around the large end of the egg. The site of this nest was in marked contrast to that of the arboreal nest reported by Rowley (*op. cit.*, p. 196), although the choice of nesting material seems to have been similar.

In a discussion of the Scaled Antpitta (*Grallaria guatemalensis*), Rowley (*op. cit.*, pp. 160–161) correctly assumes that the nest of that species reported by Edwards and Lea (Condor, 57:45–46, 1955) was discovered on 9 August 1950, at which time it contained one egg. The female was collected at this nest on 10 August 1950, and a shelled egg taken from the oviduct. Both of the eggs were pale blue, apparently paler than the "deep robin-egg blue" of the Oaxaca eggs reported by Rowley (*op. cit.*, p. 161).—ERNEST P. EDWARDS, *Department of Biology, Sweet Briar College, Sweet Briar, Virginia 24595, 7 December 1966.*

Nesting of the Black-capped Vireo in the Chisos Mountains, Texas.—The following observations of a nest of the Black-capped Vireo (*Vireo atricapilla*) were made in a narrow, dry canyon in the south slope of Pulliam Ridge in the Chisos Mountains of Big Bend National Park, Texas.

From its mouth upward this canyon gradually decreases in depth from about 100 to 70 feet and in width at floor level from about 150 to 50 feet. The walls and floor of the lower part consist of talus with an open growth mostly of Greg's ash (*Fraxinus greggii*), evergreen sumac (*Rhus virens*), the century plants (*Agave leuchuguilla* and *A. scabra*), ocotillo (*Fouquieria splendens*), prickly pear (*Opuntia* sp.), bear grass (*Nolina erumpens*), and sotol (*Dasyllirion leiophyllum*). Among these shorter plants, especially on the canyon floor, grow scattered junipers (*Juniperus* sp.), pinyon pines (*Pinus* sp.), and small-leaved oaks (*Quercus* sp.). Above 5800 feet sheer granite walls replace the talus slopes. In the cooler and shaded section formed above this elevation there is a decidedly more mesophytic vegetation dominated by a grove of large oaks (probably *Q. gravesii*) with a fairly dense understory of Mexican buckeye (*Ungnadia speciosa*) and hackberry (*Celtis* sp.) entwined with wild grape (*Vitis* sp.).

At approximately 17:00 on 4 May 1966, after having pursued a singing male Gray Vireo (*Vireo vicinior*) up a narrow side canyon, I paused at the top of the east wall of the main canyon above the mesic area and looking down noticed a pair of Black-capped Vireos foraging in the underbrush. The birds moved silently throughout this area for several minutes and then flew