The Azure-rumped Tanager in Mexico with comparative remarks on the Gray-and-gold Tanager.—The Azure-rumped Tanager (*Tangara cabanisi*) is perhaps the least known of a large genus of neotropical tanagers. Described in 1866 by Cabanis and renamed in 1868 by Sclater (1868, Ibis 4: 41–72), the species has been taken at a single locality in southwestern Guatemala and two localities in western Chiapas, Mexico. Four specimens exist at the following institutions: Berlin Museum, the type, Imm. ♂, Costa Cuca, Guatemala (see Sclater, ibid.; and Hellmayr 1936, Cat. Birds Amer., pt. 8, p. 139); University of Michigan, imm. ♀, 29 August 1937, Mt. Ovando, Dist. Socunusco, Chiapas, Mexico (Brodkorb 1939, Auk 56: 447–450); Occidental College, ♂, #37328, 15 May 1943, presumably Cacahoatan, Chiapas, Mexico, 600 m, and #37329, same as preceding 14 April 1943, collector M. Del Toro Aviles.

The species has been seen occasionally in recent years in the Sierra Madre de Chiapas by Miguel Alvarez del Toro (pers. comm.). David Simon (with others) found a single bird on 8 April 1972 and two more on 14 April on the "El Triunfo trail" across the Sierra Madre de Chiapas between Mapastapec and Finca Prusia, Chiapas at an elevation of approximately 1220 m. This locality (about 16 km west of the El Triunfo settlement described by Andrle 1967, Condor 69: 93–109) has since been visited by another party 22 April 1973 and by Hilty (with others) 29 May, 3 June, and 25–26 December 1974.

Azure-rumped Tanagers were seen chiefly at two forest clearings (1220 and 1460 m respectively) along the "El Triunfo trail." The upper clearing lies at the extreme lower fringe of the cloud forest discussed by Andrle (ibid.). Here humid evergreen broadleaf forest is dissected by numerous small streams, many of which do not flow during a January-to-May dry season. Most trees are tall (in excess of 25 m), and epiphytic growth is light. Some branches are mossy. At approximately 1450–1550 m mixed broadleaf and conifer forest alternates with pure hardwood. No conifers were evident at any of the sites where Azure-rumped Tanagers were found.

On 8 April Simon saw an Azure-rumped Tanager foraging in tree tops at the edge of the lower clearing with a mixed species flock. The bird was generally inactive and often perched quietly for several minutes although some foraging activity was noted. Two Azure-rumped Tanagers were seen with a larger flock in the same vicinity on 14 April. Both birds were foraging actively and uttered two types of call notes.

On 22 April 1973 Theodore A. Parker III and Mark B. Robbins saw three individuals at the upper clearing and two pairs at the lower clearing. On 29 May and 3 June 1974 two pairs appeared to be resident at the upper clearing but only a single pair was located at the lower clearing. Individuals frequently crisscrossed the clearings, perching in the uppermost branches of large trees at the forest edge. Here on 22 April 1973 two birds fed in fruiting Melastomataceae shrubs and in May–June 1974 two pairs frequently fed at a large fruiting *Ficus* sp. tree (fruits largely unripe) at the edge of the upper clearing. Azure-rumped Tanagers spend a fair amount of time busily foraging among leaf axils and along terminal branches where they probably take a variety of small fruits and insects. On 29 May 1974 a pair searched small (<50 mm diameter) mossy branches within the forest canopy. Both birds moved restlessly along branches turning sideways frequently to examine the undersides of their perches. This "looking under" motion is typical of most forest-dwelling *Tangara* (e.g. *T. florida, arthus, icterocephala, parzudakii*), but is less often used by ones that inhabit clearings (e.g. *T. cyanicollis, nigrocincta, vitriolina*). On several occasions birds perched on exposed bare branches above the canopy, sitting quietly for as long as 20 min, or flycatching, making short clumsy sallies. As with most *Tangara*, Azure-rumped Tanagers also forage low at fruiting shrubs, and on 22 April 1973 Parker even flushed a bird from the ground on the trail at the base of a Melastome shrub.

In contrast to the foraging behavior of other forest-based *Tangara*, the Gray-and-gold Tanager (*T. palmeri*, a species restricted to extreme northwestern South America) hunts insects principally by flycatching from tree tops. Although some *Tangara* opportunistically flycatch, the habit, commonly practiced by both Gray-and-gold and Azure-rumped Tanagers, is normally shared with few other *Tangara*. In Hilty's experience, when several *Tangara* occur sympatrically, none regularly engage in all the previously mentioned foraging activities (looking-under, leaf-searching, and treetop flycatching) used by the allopatric *T. cabanisi*. The greater foraging latitude presumably exploited by *T. cabanisi* may accrue in part to an absence of competing sympatric congeners.

No evidence of breeding was noted, but all birds watched 29 May and 3 June were presumably paired while on 26 December a flock watched by Sartor O. Williams III and Hilty contained 16 individuals. In April observers noticed both small flocks and pairs. The tendency of many *Tangara* to form or join small mixed or solid flocks is well known and flocking *per se* may prove an unreliable gauge of lack of breeding.

Azure-rumped Tanagers also bear a striking similarity to Gray-and-gold Tanagers in plumage pattern, color, size, and vocalizations. The similar appearance of these two species has been noted by Hellmayr (1910, Ibis 4: 327–331) and their plumage differences compared in detail (also see excellent color plates in Sclater (op. cit.) and Hellmayr (ibid.). The Gray-and-gold Tanager is probably the largest member of the

genus (wt. 32.6 g, n = 9, Hilty, unpublished data), and it appears slightly larger than the Azure-rumped Tanager in the field (wt. unknown).

Calls of the Azure-rumped Tanager include flat bursts of ticking notes, a lower slower "se-e-eet" or "se-a-weet" (rising inflection) and a louder excited "chip chup swee-e-eet swee-e-et," or "chi-tuck tweeet," usually given just prior, during, or immediately following flight. In Hilty's experience, the Gray-and-gold Tanager is the only other member of the genus that utters calls similar to the latter two vocalizations (very unlike other *Tangara*) and in presumably the same context. These noisy calls make the Gray-and-gold Tanager highly attractive to many flock-forming species. It is not known if the similar sounding calls (to our ears) of the Azure-rumped Tanager are an equally attractive stimulus to flock-forming birds.

Both species occupy widely separated but highly restricted ranges in humid tropical regions, and little is known about the habits of either. The similarities noted here suggest a close phylogenetic relationship. The differentiated populations of Azure-rumped Tanagers and Gray-and-gold Tanagers now isolated at the northern and southern end of the humid tropics in Central America and adjacent northwestern South America, respectively, are paralleled in other passerine groups such as jays of the genus *Cyanocorax*.

Where forest disturbance occurs, small second-growth fruiting shrubs often become temporarily abundant. The resulting food increase may benefit many small frugivores such as the Azure-rumped Tanager. The number of recent sightings of these tanagers at clearings may be attributable in part to the rapid deforestation now occurring in Chiapas.

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A simple technique for analyzing bird transect counts.—Natural resource inventories commonly call for density estimates of all bird species in an area throughout the year. Transect methods (reviewed by Eberhardt 1968, J. Wildl. Mgmt. 32: 82 and by Emlen 1971, Auk 88: 323) are perhaps the most appropriate means for making such estimates. This paper describes a simple method of analyzing transect counts used by Balph and Balph (MS) to estimate bird densities by species at 2-month intervals through 1 year on a limited budget.

Data for analysis were collected on line transects in each of several vegetation types near an arid-lands river in eastern Utah. Information recorded included the identities of birds seen on transects and the lateral distance from the transect line to the point of first sighting. Lateral distances were grouped into the following meter intervals: 0–5, 6–10, 11–15, 16–20, 21–25, 26–30, 31–40, 41–50, 51–75, 76–100, and >100. The first interval (0–5 m) was judged to be wide enough to obtain a good sample, yet narrow enough to assume reasonably that all birds within the corridor would be seen. Variability was measured by comparing day-to-day counts made on the transects.

Data were used to maximize the density estimate for each species seen during a given transect walk. The procedure is illustrated using hypothetical data presented in Table 1. The largest number of individuals of species A (i.e. 7) occurs in the first (i.e. 0–5 m) interval. Given a transect 2,000 m in length, 7 individuals of species A are estimated to be present in a 5 × 2,000 m area doubled to include both sides of the transect—a corridor of 20,000 m^2. Expressed in number of birds per km^2, the density of species A is 350. For species B, the density estimate is maximized by averaging the values in the first two intervals, which gives 1.5 birds per

TABLE 1
HYPOTHETICAL DISTRIBUTION OF INDIVIDUALS OF SEVERAL BIRD SPECIES SEEN AT VARIOUS LATERAL DISTANCES FROM A TRANSECT LINE

	Distance from transect line (m)					
Species	0–5	6–10	11–15	16–20	21–25	26–30
A	7	5	2	2	0	1
B	1	2	0	1	0	0
C	0	0	0	0	1	0