

ALTIMETER

MANOMETER

2000	2000 <del>0</del>
4050	4000
4550	4610
5125	5150
5750	5850
5990	6000
6890	6800
6920	6900
7980	8000

I. Peunion (April 12)

Central arrows

(corrected)

Small: approx .5

6

ALTIMETER

MANOMETER

Good: exactly 6

6900 - 6920

Long: approx .1

Insert: between 29.8 and 29.9

Arrow inner ring: a little above 0

Arrow outer ring: 8

II. Upper Parture (April 13)

Central arrows:

Small: approx .6

6800 - 6889

Broad: 6.8

Long: approx 6.178

Insert: 29.838

Arrow inner ring: .1

Arrow outer ring: 8

III. Great Bend

Central anows

ALTIMETER (corrected) MANOMETER  
~~MANOMETER~~ ~~alt~~

5750' - 5850

Small: 0.5  
Broad: 5.75  
Long: 7.22

IV. Upper edge claus

Central anows

5125' - 5150

Small: 0.4  
Broad: 5.1  
Long: 1.25

V. El Water

Central anows

4550 - 4610

Small: 0.4  
Broad: 4.5  
Long: 4.85

(The other indicators were the same at all 3 of these last stations  
Anow inner mg: 0.08. Anow outer mg: 0.8. Dial: 29.8375.)

Summit  
12,000 +

Mixed Flocks

①

October 4, 1960  
Cerro Punta

Beginning work just below high pasture 6:50 a.m.

Group I. 2 Yellow-throats, 2 Sootycaps, 1 Black-checked W., 1 Wilson's  
1 W. ♂, 1 Hummingbird.

1 Yellow-throat f., 1 Sootycap f., 1 Wilson's leaving without  
C. f.

2 ♂ Wilson's W. feeding about 20 feet apart. Apparently  
both quite isolated. Then one flies over to attack the other! This is why  
there is only one Wilson's per flock.

Group II 1 Flame throat, 1 Andean Flycatcher, 2 Collared Redstarts

Group III. 3 Yellow-throats, 1 Wilson's W., 2 Black-checked W.,  
1 Collared R.

Wilson's W. always seems to be on the outskirts of mixed flocks.  
Extremely peripheral!

In Group III, the Black-checked W.'s definitely did not continue  
to go in the direction in which the Yellow-throats went.

Group IV 1 ♂ Wilson's W. 1 Eye-ringed Flatbill

1 Wilson's f → Flatbill.

Group I Same place - 2:20 pm.

3 Yellow-thighs 1 Yellow-throat

1 Yellowthroat f → Yellow-thighs

Group VI Above upper pasture.

2 Collared R., 1 ♂ Wilson's W., 1 Yellowish Flycatcher

It is obvious that the Collared Redstarts, the Wilson's Warblers, and some of the small flycatchers (and possibly the Flame-throated Warblers) are not nearly as closely confined to brush as the brush-tanagers and bush-finches. They will feed in and among isolated trees in the bare pasture, where the brush birds apparently never go.

Twice today (once above and once below the upper pasture) I have seen one or two Red Squirrels running around in the shrubbery near where mixed flocks of birds were feeding. Silent both times. But last March I remember watching a group of 3 squirrels, feeding in much the same area as a mixed flock of birds; and these squirrels were quite noisy - uttering harsh notes like CN's or ACN's of some bush finches (I think).

Perhaps the squirrel is really a member of these mixed flocks too

Mixed Flocks

I have now seen a pair of Plate-throated Redstarts (up here, above the upper pasture!) feeding on the ground. On a bare 6 ft. wide trail.

I have been much impressed by how quiet all the mixed flocks here seem to be now.

Group VII 3 Yellow-throats, 1 ♂ Wilson's W.  
Wilson's ♀ → Yellow-throats

Group VIII 2 ♂ and 1 ♀ Wilson's W. (!!!), 1 Collared R, 1 Slate-throated R, 1 Black-checked W.

1 Collared R. ♀ → Slate-throated R

Again saw Plate-throated R, feeding on ground, while Collared R fed just above ground.

Redstarts seem to be only noisy in flight now — when they utter loud "Tut" CN's.

Group IX 3 Yellow-throats, 2 Yellow-throats

1 Yellow-throat ♀ → Yellow-throat

1 Yellow-throat ♀ → Yellow-throat

Group X 2 Sooty caps, 1 Black-checked W, 2 Yellow-throats, 1 ♂ Wilson's W, 1 Slate-throat R, 1 Collared R, 1 mixed Wren

1 Sooty cap ♀ →

1 Sooty cap b. ♀ ←

Mixed Flocks

1 Black-cheek j. → Yellow-thigh  
6 Yellow-thigh f. → Black-cheek

I have used the term "following" in this count in a rather different way from in our counts of the blue and green tanagers and honeycreepers. I have included following by hopping as well as by flying. And I have counted each following hop separately, as long as the successive hops were separated by an appreciable pause. The Yellow-thigh following the Black-cheek recorded above may be cited as an example. All 6 instances of following were really part of one reaction. The Black-cheek was moving rapidly through the bushes. The Yellow-thigh hopped after it, paused, hopped again, paused, etc. etc. etc.

October 2, 1960  
Cerro Punta

In great bend area, 6:15 a.m.

Group I. 6 Brown-caps, 2 Buff-fronted Foliage-gleaners, 1 Silver-throat, 2 Yellow-thighs, 2 Chestnut-capped Atlapetes (!), 1 Slate-throated R

3 Foliage-gleaners j → Brown-caps

1 Silver-throat j →

5 Foliage-gleaners f. → Brown-cap

(The association of the Chestnut-capped Atlapetes with this flock was probably purely coincidental, just passing through.)

3 Yellow-thigh f. →

This flock seemed to form about 1/2 hour after dawn. Then it was active and noisy (i.e. the Brown-caps were noisy) for about 1/2 to

Mixed Flocks

(5)

3/4 of an hour. Now (7:55 a.m.) the birds are largely silent and comp  
aratively sluggish. I have great difficulty seeing the birds now, but I  
don't think the flock has actually broken up yet.

- 1 Yellow-thruff f. —————> Brown caps
- 1 Brown-cap f. —————> Yellow-thruff
- 1 Brown-cap f. —————> Yellow-thruff

Also 1 ♀ Yellow-faced Tanager and a couple of humming birds  
in flock temporarily.

There was another burst of activity in the group around 8:15  
a.m., but this quickly died down.

- Group II
- 1 Blue Jayager, 1 ♂ Wilson's W.
  - 1 Wilson's W. f. —————> Blue

- Group III
- 2 Slate-throat R., 1 ♂ Wilson's W.
  - 1 Wilson's W. f. —————> Slate-throats

It was quite noticeable that the 1 Blue Jayager mentioned above  
made no attempt to join the Brown-caps, although the latter were quite visible  
and audible about 100 yards away.

- Group I (again)
- 1 Yellow-thruff f. —————> Brown Caps

I think the counts of group I today do not give a really fair pic  
ture of the closeness of the association between the Yellow-thruffs and the  
Brown-caps in this flock. The Yellow-thruffs stick with the Brown-caps  
almost all the time. The counts of joining and following are so low simply  
because the Yellow-thruffs are so difficult to see most of the time.



1 Pepper-shrike and 1 ♀ Wilson's W also joined the flock  
 Also 1 Rufous-bellied Robber.

For the first time this morning I saw a pair of Black-chested Warblers down here. They were not with a mixed flock, however. (Although by the time I saw these warblers, ca. 9:55, the flocks had rather disappeared anyhow.)

One aspect of Group I this morning was rather surprising. The birds moved up and down, quite regularly, along approx 750 yds of road. They worked on both sides of the road, sometimes penetrating 50 yds or so into the brush, away from the road, but no more. They seemed to be following a regular route, going clockwise around an irregular oval. Again and again. They never strayed out of this area, although there did not seem to be any mixed flocks (or any other Brown-caps by themselves) on any side!

There were a few brief bursts of activity in the Group I mixed flock until about 9:15 a.m. separated by longer and longer intervals. And then the birds just disappeared. Presumably resting.

I am fairly certain that the 2 birds I have cited as "Buff-fronted Foliole-gleaners" above were indeed Phylidors rufus. It is just barely possible, however, that they were Anabacornis variegaticeps or Cranioleuca erythropus. I must check with skins.

In any case, this pair of "Foliole-gleaners" was obviously very very strongly attached to the Brown-caps (probably even more so than the Yellow-throats). Stuck with the Brown-caps almost steadily. Followed them everywhere.

As a result of two days' observation here this trip, I am beginning to think that the mixed flocks here, like the mixed flocks on BCI, tend to be composed of 2 partly different associations. Here they are the warblers and

## Mixed Flocks

(7)

association (comparable to the honeycreeper association on BCI) and the bush finch and bush-tanager association (comparable to the tanager association on BCI).

One thing I forgot to mention above.... The Brown-caps were very noisy, this morning, when 5 or 6 of them were quite close together, and there was a lot of excited-looking flying back and forth. This flying back and forth was usually accompanied by lots of R. (I think these R's were only uttered in flight. In any case, they were the sort of R which always makes me think of "CN" bird's. Between flights + R's, the birds uttered only single CN's, or fairly slow series of 2 or 3 or 4 CN's. Mostly "Tuck" CN's, I think.) I think these R's and flights must have been hostile. If so, there is still hostility within the flock, even in the middle of the non-breeding season. Interestingly enough, birds of other species seemed to be particularly likely to join and follow Brown-caps when they were flying about excitedly and uttering lots of R's. The intra-specific hostility of Brown-caps may be considered "attractive" to other species.

I think the mixed flocks here must be more highly developed than the blue and green tanager and honeycreeper flocks in the low lands. There are relatively more cases of overt following and joining here. And I have yet to see an inter-specific supplanting attack here!

The relationship between the Brown-caps and the Yellow-throats is certainly not dependent on food. The Yellow-throats often follow 20 feet behind, and 30-50 feet below the Brown-caps.

The Foliage-gleaners, however, are usually right up there with the Brown-caps. So they may well get insects disturbed by the Brown-caps.

2:55 p.m. Working just above the leaves

Group IV 6 Golden-crowned Warblers, 1 Slate-throat R, 1 Woodcreeper

- 1 Slate-throat R ♂ → Golden-crown W
- 1 Slate-throat R ♀ → Golden-crown W
- 1 Woodcreeper ♀ → Slate-throat R

Group V 5 Silver-throats, 2 Parula W, 1 Woodcreeper, 1 Pepper-shrike

1 Golden-wing W, 1 Green Tanager, 1 hummingbird

- 1 Silver-throat ♀ → Parula
- 1 Woodcreeper ♀ → Silverthroat
- 1 Parula intra-specific fight
- 2 Silver-throat intra-specific fights
- 1 Golden-wing W ♂ → Pepper-shrike

Group VI 2 Wilson's W, 2 Blue Tanager, 1 Silver throat 1 Pepper-shrike, 1 Slate-throated R, 1 Bay-headed Tanager, 1 Black and white W, 1 White-winged Tanager, 1 Greater Kiskadee, 2 Woodcreepers.

1 Blue ♂ → Bay-headed

also a couple of Pale-bellied Robins in group

1 Blue ♂ →

1 Kiskadee supplanting Robin

(supplants)  
\*

It is obvious that down here we are getting very heterogeneous "open areas" mixed flocks, like the ones in young second-growth in the Coral Zone. It may be significant, therefore, that I saw my first inter-specific supplanting attacks, and my first intra-specific contact fights, here in the flocks this afternoon.

Although there are certainly Yellow-throated Atlapetes around here

Mixed Flocks

re new, I have yet to see one of them in a mixed flock this afternoon (but I did see a pair following a mixed flock here on the afternoon of Oct 3, the day I arrived). I think they just are just mixed flocks are frequently here, because Yellow-throats are abundant in the area (and Brown-caps are relatively rare).

The Golden-crowned Warblers are very noisy when moving about. Uttering "Tut" calls, accelerating into a "Whell" in flight. These notes are even louder and stronger than those of the Black-headed Warbler.

I think (but am not sure) that all the Wood-wrens I have seen this afternoon have been Spot-crowned Wood-wrens, Lepidocolaptes affinis.

Group II (Again). There was quite a heavy rain after my first observations recorded above, but I finally stopped at 3:30 p.m.

I then went back to Group II and found it still very heterogeneous.

By this time, at least 3 Brown-caps had joined the flock. They did not seem to be very "nuclear" within the flock. Other species were not reacting to them very frequently (I saw no definite cases of following or joining). I imagine that the Brown-caps were less "attractive" simply because there was too much "competition" around - especially the noisy Yellow-throats and Golden-crowned Warblers. You could hardly hear the Brown-caps in the general din, and many of the other species in the flock were at least as restless as the Brown-caps.

October 6, 1960  
Cerro Punta

6:15 a.m. Working night at the level of Cerro Punta

Group I 3 Brown-caps, 1 Hairy-throat, 2 Green Herons

1 Gouanet j → Brown-caps

Group II 2 Brown-caps, 3 Pale-vented Robins, 1 Woodcreeper, 1 Yellow-thrasher, 2 Silver-throats, 1 Goldfinch, 1 Flame-colored T

2 Robins j → Brown cap

1 Robin f → Brown cap

2 Robins supplanting Silver-throat

Group III 3 Brown-caps, 2 Yellow-throats, 1 Pale-vented Robin, 1 Wren

1 Woodcreeper, 1 Ruddy-capped Nighthawk-throat

1 Brown-cap j → Yellow-throats

This Brown-cap seemed to be attracted by a burst of WH coming from the Yellow-throats. When the Yellow-throats began WH, all the Brown-caps began SR, and one flew over to the tree in which the Yellow-throats were perched.

1 Wren j → Yellow-throats

1 Yellow-thrasher b j ←

A burst of SR-ing by the Brown-caps seems to provoke a burst of quite loud "Tuck" CN's by the Yellow-throats (who had been silent before). Then a general burst of calling by all the birds in the group, including the Woodcreeper.

Group IV 2 Hairy-throats, 1 Wilson's W.

Group V 2 Brown-caps, 1 Silver-throat, 1 Collared R, 1 Flame-throated R, 1 Golden-wing W, 1 Queen Gouanet, 1 Wilson's W, 2 Black and white

Mixed Flocks

to W. 19

Group I a few birds 1 ♂ Wilson's W., 1 Black-headed W.

- 1 Black-headed f → Yellow throats
- 1 Supercilious black f Wilson's → ♀

Group II 2 Yellow throats 1 ♂ 1 ♀ (Pete-throat R)

1 ♂ 1 ♀ (Pete-throat R)

Group III 2 Yellow-throats, 6 Brown-caps, 2 Collared R., 2 Red-faced Spine tails, 1 ♂ Diglossa, 1 ♂ Wilson's W., 1 ♀ Blackburnian

- 1 Yellow-throat j → Brown-caps
- 1 Collared R. j. →
- 2 Peppercorn j → Brown Caps
- 1 Yellow-throat f → Brown Caps
- 1 Red-faced Spine tail f →

I think, from my observations this morning, that the Silver-throats are not really nuclear members of these flocks. More or less regular associates, more or less like the Sangres in the blue and green tanager and honeycreeper flocks

Back in the same area 3.20 p.m.

Group IV (probably the same as VIII above) 2 White-throats, 1 Blackburnian, 2 Brown-caps, 1 Yellow-throat,

Group I (Probably partly the same as in above) 3 Silver throats, 2 Brown-caps, 2 Blue throats, 1 Blue, 1 Green Jay, 1 Wilson's W, 2 Pale-necked Redstarts

- 1 Robin *erythrorhynchos*, Silver throat
- 1 Robin *utahensis* *superciliosus* (Silver throat)

The Robin is certainly a most aggressive species. Obviously, although we force in the mixed flocks. These particular robins seem to have a preference for mixed Silver throats.

The Blue-throated Redstarts do not seem to be nuclear in their flocks. They are perhaps more often associated with mixed flocks than not, but they don't react to the other species very conspicuously, nor do the others react to them in very conspicuous ways.

October 17, 1960  
Cerro Punta

Working by great bend 6:15 a.m.

Group I (The same as Group I, Oct. 8) 6 Brown-caps, 2 Rufous-fronted Toloray Gleaners, 2 Yellow-throats, 1 Wilson's W, 2 Silver throats

- 7 Toloray gleaners → Brown caps
- 2 Brown Cap f. → Wilson's W
- 3 Wilson's W. f. → Brown caps
- 3 Yellow-throat f. →
- 2 Yellow-throat j. → Brown-caps

The white undersides of the wings of the Brown-caps are very conspicuous in flight and during WF's. Typical flash pattern

1 Yellowthroat (singing) 10:00  
 2 Yellowthroat (singing) 10:00  
 3 Yellowthroat (singing) 10:00  
 4 Yellowthroat (singing) 10:00  
 5 Yellowthroat (singing) 10:00  
 6 Yellowthroat (singing) 10:00  
 7 Yellowthroat (singing) 10:00  
 8 Yellowthroat (singing) 10:00  
 9 Yellowthroat (singing) 10:00  
 10 Yellowthroat (singing) 10:00

This flock of birds seemed to assemble by the same route as the day before yesterday. A group of Brown-caps, "attended" by a pair of Yellow-throats and a pair of Foliage-gleaners. First became active around 6:30 or 6:45, and died by 7:00.

I saw a little more of the formation of the flock this morning. When I first arrived, I saw only a little group of approx. 3 Brown-caps, feeding actively but quietly. The Yellow-throats were moving about, some distance away from the Brown-caps. Apparently not part of the mixed flock yet, but heading regularly in the general direction of the Brown-caps. Then, around 6:30-6:45 there was a sudden outburst of SR-ing among the Brown-caps. At this time, I noticed that there were at least 6 Brown-caps in the group. What I imagine happens is that the family parties of Brown-caps sleep separately, and only encounter one another some time after dawn. This particular flock seems to contain at least two family parties of Brown-caps. (I saw no signs of any birds "singing" on territories here this morning.) At the same time that I heard the big burst of SR-ing among the Brown-caps, I saw that they had been joined by the Yellow-throats, the Foliage-gleaners, and the Wilson's Warbler. I imagine that the Yellow-throats and Foliage-gleaners just start to feed at dawn, and then attach themselves to the Brown-caps whenever they happen to run into them. If they haven't run into the Brown-caps before the latter begin their frequent SR-ing, then they must certainly join the Brown-caps



as soon as the SK-veg begins.

The mixed flock today kept within the same boundaries - see Aug 16 fore yesterday, but its movements within these boundaries seemed to be much at more irregular today.

I know that there are Yellow-throats near the edge of the flock's range (if not actually inside the range). Why don't they join the flocks???

The association of the Silver-throats with the flock this morning was very brief. When all the birds were feeding in the tree-tops. At this time, both the Silver-throats and the Brown-caps were particularly noisy - these 2 species do seem to stimulate one another's vocal powers. Also see active. But I could n't really isolate any particular following or joining reactions. Although Silver-throats do sometimes come very low, within 2 or 3 feet of the ground, they seem to be primarily birds of the high tree-tops. They occur in high tree-tops more often than do the Brown-caps.

I wonder if the Pepper-shrike is a regular member of these flocks? A very inconspicuous species. But colored quite like the Brown-caps.

The Wilson's Warbler is literally peripheral. Almost always on the outskirts of the flock.

The Brown-caps certainly do not seem to have any special call which serves only to bring the flock together or keep it together. (Vide Johnson's description of the unidirectional flocks on BCI.)

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Working in a new place. On Lewis's property, just above great bend

2:05 p.m.

Group II 1 Empidonax flycatcher, 1 Slate-throat, 1 ♂ Wilson's W

Group III 1 Slate-throat, 1 Black-chick W, 1 ♂ Wilson's W, and 1 Wren

Mixed Flocks

In addition to the bird CN and N Ill. I have heard before the other ...  
not seen, reported as ...  
East of Atlix spp. ...?

Group III 2 Yellow throats = Wilson's W

- 1 Yellow throat ... Wilson's
- 1 Yellow throat f ... Wilson's
- 1 ... Yellow throats
- 1 ... Yellow throats

Group I 2 Brown-caps, 1 Yellow-throat, 1 Imm or ♀ Summer, 2♂ Wil-  
son's W., 1 Empidonax flycatcher

2 Wilson's W f → Brown cap.

I wonder why the Wilson's Warblers are not followed or joined more? They are so noisy, active, and brightly colored. Perhaps because they only utter single CNs, no CN Ill's? Or because they are usually single?? (In this conversation, it might be noted that the 2 Brown-caps in the group above usually worked far apart, and they seemed to be much less attractive than many other Brown-caps I have seen.)

October 8, 1960  
Cerro Punta

Working below upper pasture 6:30 a.m.

Group I 2 Yellow throats, 107 Wilson's W.

I have twice, now, seen conspicuously active and noisy parties of (once a single bird, once a pair) flying about without attracting any particular attention from any other species.

I have also seen conspicuous, noisy and active Black-chinned Warblers move around without being followed or joined.

There seems to be much less turbulence in general mixed flocks here than at lower altitudes (Or is it just that the Brown-caps are much more attractive than anything here?)

Group II 1 Wilson's W, 1 Plate-throat

Group III 3 Yellow-throats, 2 Black-chinns, 1 ♂ Wilson's, 2 Callard R, 1 Pale-vented Robin, 2 Sooty caps, 2 Brown-billed Parakeets

2 Black-chinns f. —————> Yellow-throats

1 Yellow-throat j. —————> Sooty caps

2 Yellow-throat j. —————>

The Sooty caps are remarkably silent at this time of year.

I think that the Sooty caps are maintaining territory, or at least defense to home ranges, here now. So, apparently, are the Yellow-throats. I have yet to see intra-specific fights in either species, but pairs & family groups seem to be well-represented.

The Yellow-throats now seem to have segregated out of the rest of Group III. Feeding on ground by themselves.

It is obvious of course that the Yellow-throats down below were also maintaining territories or home ranges (unlike the Brown-caps). Never more than 1 family party per mixed group.

Many of the Yellow-throats both here and down are going about in family parties of 3 (never more), consisting of 2 adults and 1 young. So this is dif

Mixed Flocks

withly just the breeding season for them (see today's notes on Paragates)

- Group in (still)
  - 1 Yellow-throat f
  - 2 Warblers
- A mass with 2-3 Warblers
  - 1 Prong-billed Parakeet f → Yellow-throats
  - 1 Prong-billed Parakeet f → Yellow-throats
  - 1 Brown-capped V. no other Warblers → Warblers
  - 2 Brown-capped V. no other →
  - 1 Collared R. f →
- 1 Diglossa in pair, and 1 Salitator, and 1 Flower-throat W.
  - 1 Diglossa f → Sooty caps
  - 2 Collared R. f → Sooty caps
  - 1 Sooty cap f → Yellow-throat
  - 1 Sooty cap f → Salitator
- 1 Queen Toucanet in flock now.

It seems obvious that there is no special relationship between the Yellow-throats and sooty caps here. The Yellow-throats will follow sooty caps, just as they will follow almost anything, but they do not seem to be "fixated" on sooty caps in the way they are on Brown-caps.

I think that the "partly independent" warbler association includes only the Redstarts (and possibly the Flower-throat), with the inevitably attendant Wilson's Warblers. It does not seem to include the Black-chickadees, which are primarily birds of the interior of scrub.

October 9, 1960  
Cerro Punta

Working below upper pasture @ 30 a.m.

Group I 3 Yellow-throats, 1 Wilson's W

Group II 2 Sooty caps, 2 Collared R, 1 Wilson's W, 1 Green To

uacant, 1 Yellow-throat, 2 Pygopetes, 1 Brown-capped Vireo

2 Collared R f → Sooty caps

2 Yellow-throats f →

1 Collared R f →

1 Brown-capped Vireo j →

5 Wilson's W f → Collared R

Also 2 Flame-throated Warblers in flock

1 Flame-throat j → Sooty caps

Also at least 1 Tree-creeper in flock, + 3 Hummers + 1 Cowbird!  
and 2 Black-headed Warblers. Also couple small Pygopetes

A squirrel with the flock again! Also 1 vireo, + 1 Rose-throated R.

I am fairly certain that the wood-creeper with this flock is Lepidocolaptes affinis. It is staying with the flock very closely for quite a long time. (This may also be the species I saw with the flock just above the claus a few days ago.)

1 Sooty cap j →

2 Collared R j →

I think that there is only one large flock in this whole area. Quite diffuse, splitting and re-joining in rather ameboid fashion. Possibly a few very small flocks (no more than 2 or 3 birds) are more or less separate most of the time.

Yesterday morning, this flock formed rather late (after 7:30) and remained conspicuously active for quite a long time. This morning it formed earlier (very shortly after I arrived) and did not remain conspicuously active very



3 Wilson's W b →

Two squawks with the flock again

Watching the front pair of Black-chicks again. Still not being followed or joined (although there are Wilson's Warblers, Flycatchers and Yellow-throats, at least, in the neighborhood).

There is a family of 3 Yellow-throats here which has been moving about by itself for quite a long time now. It was associated with the large flock earlier this morning, but the warblers (and the footy caps) flew off and the Yellow-throats made no attempt to follow.

It is my impression that, here and now, with the bulk which it is my warblers and bush-tanagers (i.e. the Black-chick and the footy caps) being so relatively un-attractive, the Yellow-throats tend to segregate out from the mixed flocks quite frequently - much more frequently than last March here (and much more frequently than the Yellow-throats lower-down now, where the Brown-caps are active and noisy).

I think that the relative un-attractiveness of Black-chicks and especially footy caps here now (compared with last March) must be due to the fact that they are less many now.

This indicates that noise, not color or movements, is the principal constituent of a species attractiveness.

- 1 Collared R j → Plate-throat
- 1 Brown-capped Vireo j → Plate-throat
- 1 Plate-throat f →
- 2 Wilson's W j →

2 Tree creepers (same species as yesterday) also in flock

December 8, 1964  
Rio Piedras

Evening 7:30 am

Group I 1 ♀ ~~...~~ 1 ♂ Yellow-rump, 1 ♀ Tanager, 1 Palm  
Tanager

1 ♀ Tanager f → ♀ Yellow-rump  
1 Palm f →

W. Palm in this group was probably very low, no more than 1 foot off the ground from this side

Group II 1 ♀ Variable, 2 ♀ Yellow-rumps, 4 Palms

1 ♀ Yellow-rump f → Palm  
1 ♂ Yellow-rump f → Palm

Again, these Palms were very low

Group III 4 ♀ Yellow-rump, 1 ♂ Yellow-rump, 1 ♂ Tanager,  
1 ♂ Blue Black Grosbeak, 3 Plain-colored Tanagers (!), 2 Golden  
Masked Tanagers, 1 Blue Tanager, 1 Panama Wren, 1 Green-backed  
1 ♂ and 1 ♀ Tree Toad

1 case ♀ Yellow-rump definitely not being followed  
1 Blue j → Plains  
1 case ♂ Yellow-rump definitely not being followed  
1 Golden-mask j →  
1 ♀ Yellow-rump f → Green-back



In this last flock, the Blue Green birds. They were now left the Phaenopneustes group. I think the interaction between the two groups was a purely "sexual"

The Blue Green-birds, & Palmers were, however, feeding quite low most of the time; rather like the Palmers I saw with Yellow Rumps earlier.

I also saw a mixed flock of Blues and Green birds earlier this morning. They were feeding only moderately low, and kept quite apart from Phaenopneustes.

The Yellow-rumps certainly do not seem to be nuclear for any of the nuclear blue and green species!

also 1 Black-capped Saltator in group

Group IV 2 ♀ Variables, 1 ♀ Yellow Rump

2 ♀ Yellow Rump f → Variables

Group V 1 ♂ Variable, 1 ♀ Yellow Rump, 1 ♂ Yellow Rump

1 case ♂ Yellow Rump definitely not being followed

Group VI 1 ♀ Yellow Rump, 1 Palmer, 1 ♂ Variable, 1 ♀ Variable

There are really quite a lot of Yellow-rumps here today.

They are quieter, on the whole, than I expected. Quite silent, usually except when flying and/or disturbed by me.

They frequently occur in groups of 3-6, but apparently single

birds and parts of the flock. They are just scattered all along the edge of the woods. In the morning I observed several flocks.

I have been very good in following birds. I follow Yellow-rumps. Also by being in the flock as other birds.

It is easy to say that the Yellow-rumps are in some much less species in other mixed flocks. It is true, now to be presented from being nuclear by 2 factors. 1. They cannot be present nuclear because other species are present to them. 2. They cannot be really active nuclear because few or none of the other species are so close, refused to move away. (Yellow-rumps also tend to stay lower in the vegetation than most other tanagers.)

I have seen very few flocks since too few to determine how they are reacting to the Yellow-rumps. It may be significant, however, that the few flocks I have seen have all been associated with Yellow-rumps.

November 18, 1950

Rio Piedras

8:45 am

Group I 4 ♀ Yellow-rumps, 1 ♂ Yellow-rump, 1 Clay-colored Thrush, 1 ♀ Summer Tanager, 2 Green-backed Sparrows, 1 ♂ Banded Ant-tanager

2 cases ♀ Yellow-rump not being followed

1 case ♂ Yellow-rump not being followed

Group II 4 ♀ Yellow-rumps, 2 ♂ Yellow-rump, 1 ♀ Huckle-billed seed-finch, 1 imm. ♂ Euphonia (B. or B.?), 1 Buff-throat Saltator

5 cases ♀ Yellow-rumps not being followed

- 1 male ♂ *... ..*
- 2 adult Yellow Rumps, not *... ..*

Group III 2 ♀ Yellow Rumps, 1 *... ..*

171

- 1 Buff-throat ♂ *... ..*
- 1 ♀ Yellow Rumps *... ..* Buff-throat

Group IV 4 ♀ Yellow Rumps, 2 ♂ Yellow Rumps, 1 *... ..*  
 Tanager, 1 ♂ Fulvous-vent Euphonia, 1 ♀ *... ..*

- 1 ♀ *... ..* Yellow Rumps
- 1 Golden-mask ♂ *... ..* Yellow Rumps
- 1 ♂ Fulvous-vent ♂ *... ..* Yellow Rumps

I was again impressed, today, by how remarkably infrequently the Yellow Rumps are joined and followed — especially in view of their extreme conspicuousness. At least 80% of all the Yellow Rumps I saw today were not associated with mixed flocks in any way.

The few *... ..* I saw today were staying low in the shrubbery even more consistently than the Yellow Rumps. (Yellow Rumps do go quite high in trees with some appreciable frequency.)

MIXED FLOCKS — QUITO REGION

May 19, 1962,  
Near Kono

1  
This morning I saw a whole group of birds feeding and moving in a flock along the ravine. Including at least 4 fraseri conbells, 4 Firebellies (2 obviously forming a pair, the other 2 rather scattered), a pair of Arrepeas olive-cyanus, at least one of Sigala terra, one bird that looked very much like a Rufous-fronted Flycatcher, various hummingbirds, and probably some other stuff.

For a while, it looked very much as if the Firebellies were playing a passive nuclear role. They were repeatedly followed by the conbells, and the 2 species, in turn, were followed by the olive-cyanuss. But then the Firebellies moved further on, into some trees, and were not followed again. The whole group seemed to disperse in an unobtrusive way.

The Firebellies (being very conspicuous) may be as attractive as possible to birds of other species, without having developed any special mechanisms especially designed to attract birds of other species, and without being the object of any special inter-specific preferences.

I have yet to see any signs of an active nuclear species here

RE INTER-SPECIFIC REACTIONS - QUITO

May 23, 1962  
Alonso

There is a species of Myzobonias here  $\sigma^7 = \sigma^7$  - apparently id.  
critical. Quite remarkably similar to Atlapetes ruficauda, 28-30% for  
yellow eye-ring and white patches on tail.

Always in pairs (at least now)

Feed in eucalyptus trees, at same levels as Diglossopus. Looking  
g for insects in the same way. Also feed in scrub, in same areas as  
Diglossopus, D. atrovirens, and (probably) Coccyzoides. As far as I  
know, do not feed on flowers or nectar.

Must be an important competitor of Diglossopus (at least)

Does not fly catch like the Chiroglaucidium redstarts (presumably there  
are no suitable flies here).

Utters lots of "Tut" "CN"s. Sometimes accelerated like "Tut"s  
of Diglossopus. Perhaps utters "Tuh"s as well.

Song quite like that of D. atrovirens, but probably more "warbling",  
and usually or always ending with a distinct "Tazeezee".

Ignores and is ignored by Diglossopus - even when feeding  
within a few inches of the latter.

Intra-specific Fights Cuna Punta

Parula W. 1

Silver-throat 11

Wilson's W 11

Yellow-throats 1

Pale-bellied Thrush 1

Supplanting Cero Pinta

Kiskadee → Pale-bellied Thrush 1

Pale-bellied Thrush → Silver-throat III

Silver-throat → Brown-cap 1

Yellow-throat → Wilson's W. 1

Evermann, E. (1937) "The birds of the province of  
Bocas del Toro, Panama" —  
Condor 9, p. 247-262

Sporophila torqueola and S. *curvica*  
associated together. Also *Volatinia*.

Jusson, R. (1932) "The distribution of bird life  
in Guatemala" — Bull. Amer. Mus.  
Nat. Hist. 54

Volatinia nearly always in company with  
Sporophila

Wetmore, A. (1943) "The birds of southern  
Veracruz, Mexico" — Proc. U.S. Nat.  
Mus. 3164, vol. 73, p. 215-340

Sporophila torqueola and Volatinia  
in association



*Catamnia aialis*

*Catamnia monata*

*Catamnia leucostriata*

of ~~the~~ Yellow-bill Cuckoo  
under tail-coverts Much lighter  
than *plebejus*

# David's Notes

## Jamming

1 Brown cap → Yellow-thigh

2 Sooty cap → Yellow-thigh

1 Yellow-thigh → Slate throat

1 Yellow-thigh → Brown cap

1 Yellow-thigh → Sooty cap

1 Yellow-throat → Yellow-thigh

2 Silver-throat → Brown cap

1 Speckled → Silver-throat

1 Flame throat → Silver-throat

## Following

3 Yellow-thigh → Sooty cap

1 Yellow-throat → Flame throat

## Supplanting

1 Red headed Parakeet → Baywing T.

Intra specific Feeds

Brown-cap 3  
Sooty cap 1  
Yellow-thr 2

March 8, 1959. Cerro Punta

GENERAL COMMENT ON THE MIXED  
SPECIES FLOCKS I HAVE SEEN NEAR  
HERE ON THIS TRIP.

In general, mixed-species flocks are conspicuous for their absence here now. The only common mixed flocks we have seen are based upon the two Redstarts, especially the Slate-throated Redstart. And tanagers are seldom or never associated with such flocks now.

The nearest thing we have seen to a mixed flock involving tanagers or finches are a few associations of several species feeding in the same trees or bushes for more or less brief periods. Such associations are probably purely "casual".

Yellow-thighed Finches and Yellow-throated Atlapetes are often feeding near together in the same hedges in the whole area from approx. 5000 ft to approx. 7000 ft.

We once saw Yellow-thighed Finches associated with a flock based upon Black-checked Warblers in a forest above 7000 ft.

Down in the sub-tropical forest, between 4000 and 5000 ft, we once saw a few Brown-capped Bush-tanagers, Silver-throated Tanager, Wilson's Warblers, and Tanager Warblers, feeding in the same trees and moving about more or less together for a short time.

March 10, 1959  
Cerro Punta

ADDITIONS

Since writing the above a couple of days ago, I have been watching one or more mixed flocks in second-growth scrub & light forest at the 17000 (appr.) ft. level. Band on Collared Redstarts always including 1 or 2 or more Wilson's Warblers and at least 1 pair of Yellow-throated Ticks. Sometimes including Yellow-throated Antpeets, Sooty-capped Bush-tanagers, Slate-throated Redstarts, Flame-throated Warblers (Yunivora gutturalis), Black-checked Warblers (Basileuterus melanogenys), and a Buddy Tree-runner. The Collared Redstarts obviously controlling the direction of the movements of the flock.

(3)

July 11, 1939 Cerro Campana

MIXED "FEEDING ASSOCIATIONS" HERE

On this trip here, I was surprised to find large groups of several species of tanagers here. All more or less feeding together in the same trees; and occasionally (at least) most of the birds moving in the same direction, eventually; but the sort of associations seem to be much looser than the Plain Tanager flocks on Barro Colorado, or the Brown-capped Bush Tanager and Collared Redstart flocks at Cerro Punta.

There do not seem to be any really "nuclear" species in the "feeding associations" ("FA's") here now, although all the groups I have seen so far have included at least Silver-throated & Bay-headed Tanagers and Tawny-capped Euphonias. But the birds in these FA's seldom or never flew off together, one right after the other, as the Plain-Blue - Palmos may do on BCI.

It may be significant, in this connection, that although many of these species are quite noisy, giving a lot of CN's, they none of them utter as many CN's as the nuclear species of other flocks I have watched.

I have also seen quite a number of other species associated with the FA's here from time to time today. Among these were Black and Yellow Tanagers (1 pair, for quite some time), Blue Tanagers (1 pair, for a short time), a single ♂ Green Honeycreeper (for a short time) and a single ♂ or a pair of Hepatic Tanagers (for a short time).

4

March 20, 1960 Cerro Punta.

MIXED FLOCKS, 7000 ft AND ABOVE

We have only been watching flocks fairly high up the mountain. At these altitudes, mixed flocks are still common, apparently not dissolved by the approach of the breeding season.

Almost every flock we have seen here, at these high altitudes, has included several Collared Redstarts, one pair of Yellow-throated Todies, one or more Wilson's Warblers, and a single bird or a pair of Sooty-capped Bush-tanagers. Probably also a pair of Yellow-throated Atlapetes in almost every flock, and one or more birds of one or more species of Dendrocolaptes. At the highest levels, one or more Black-checked Warblers are also closely associated with almost all flocks. Slate-throated Redstarts, Flame-throated Warblers, and even Digeles, are sometimes associated with the flocks, but they seem to be less common and/or more independent at all these relatively high altitudes.

(Note: Collared Redstarts are not common now at relatively low altitudes where they were common during March of last year; and I have yet to see Flame-throated Warblers quite as low as I did last year.)

March 21, 1960 Cerro Punta.

MIXED FLOCKS, 7000 ft AND ABOVE.

I don't think my comments yesterday were very penetrating.

We have actually been observing 2 kinds of flocks.

Below the pasture the flocks are essentially composed of Yellow-thighed Gnatcatcher, Silver-throated Atlapetes, Sooty-capped Bush-tanagers, and Wilson's Warblers. Plus miscellaneous other things from time to time, of course. (Today we even saw a Perisoreus associated with a flock below the pasture)

Above the pasture, Collared Todytars and Black-chested Warblers become "regular" members of the flocks (along with other things around)

Among the definite positive social reactions we have seen in these flocks were the following: 1 case of a Sooty-capped Bush Tanager following a pair of Yellow-thighed Bush Tickers. 1 case of a Wilson's Warbler following a pair of Sooty-capped Bush Tanagers.

MIXED FLOCKS, 6000 ft OR LOWER.

Today we saw a pair of Silver-throated Tanagers join, and twice follow, a flock of 4 or more Brown-capped Bush-tanagers.

March 22, 1960. Cerro Punta

MIXED FLOCKS, 6000 ft OR LOWER

Today we saw a most interesting flock, quite low, almost at the upper edge of the "claves".

It was composed of the following birds: at least 3 Brewa-



Capped Bush-tanager, 1 pair of Spurred Tanagers, 1 ♂ Scarlet-throated Tanager, 1 ♂ Wilson's Warbler, a Blue Tanager definitely by moving about together. The only species with a reaction we noted was one instance of a Spurred Tanager charging away the Dams when the latter got too near.

In the same area, at approximately the same time, were at least 2 (and probably more) Silver-throated Tanagers, and 1 Slate-throated Redstart.

This group would appear to have been a mixture of a highland mixed flock and a lowland mixed flock. (It may be significant, in this connection, that it has been raining hard all along the upper part of Cerro Punta and the volcano almost steadily since yesterday afternoon. The rain has been much less lower down, near the llanos. So perhaps the highland flocks have been moved downward.)

March 29, 1960. Cerro Punta

ALL MIXED FLOCKS HERE

Although we haven't been able to see much in the way of mixed flocks here this trip, a few things seem to be clear.

The principal constituent of the flocks is the Brown-Cap — Yellow-thigh relationship or the Sooty Cap — Yellow-thigh relationship. This seems to form the nucleus of all the really large and conspicuous flocks.

One or two Wilson's Warblers usually follow each flock. They might be considered "parasites", except for the fact that their loud CN's may increase the attractiveness and cohesion of the flock as

a whole

We have seen few or no obvious cases of Wilson's Warblers following & joining other individual birds in mixed flocks. All or most Wilson's Warblers just seem to drift along in more or less the same general direction, at approximately the same speed, as any particular flock they happen to be associating with at the time.

The Yellow-throated Parula finches are even more "parasitic" than Wilson's Warblers, as they contribute much less to the general movement of a mixed flock. At the same time, at least, the Yellow-throats are always in pairs, and there is never more than one pair per flock. It is also hardly possible that the Yellow-throats perform more "special" following reactions than the Wilson's Warblers.

(The roles of the tree-keepers associated with mixed flocks may not be very different from that of Wilson's Warbler and/or that of the Yellow-throats. The Pranga todaggers also behave in a somewhat similar way.)

(The behavior of Black-checked Warblers in relation to mixed flocks is discussed in today's notes on Bauleuterus.)

We have not seen enough Redstarts associated with flocks here this trip to be able to add anything to my previous notes.

May 23, 1961

Cerro Pichincha, near Quito

On previous years, I got the impression that mixed flocks of 9-gimmard songbirds did not occur here.

During my observations this year, however, I have seen a few mixed flocks. Including almost anything: Atlapetes rufinucha, Dryobates atrifrons, the local "Hensington", Geothlypis trichas, the Black-vented Warbler (Barkentonus nigrocrinitus), and a local species of furnariid (rather Myioborus-like in shape — essentially rufous all over, lighter below probably with a dark streak through the eye). But I still think that such flocks are usually purely casual aggregations (see below for the one conspicuous exception).

It may be significant that none of the species listed above show much intra-specific gregariousness.

It may also be significant that mixed flocks were much more conspicuous this evening than at any other time I have watched birds here. It was very foggy this evening, with nearly constant drizzle.

The local redstart (Myioborus melanocephalus ruficollis) is definitely not part of the mixed flocks here. It stays up in the trees most of the time, while the mixed flocks are usually in moderately low shrubbery and hedges.

The only very distinct inter-specific relationship I have noted was between Atlapetes rufinucha and the local furnariid described above. This evening a pair of the furnariids seemed to be following a pair of the Atlapetes, quite steadily, (when the birds were undisturbed).

	Mr. Buds	Mr. Justin	Yellow	Green	Being Yellow	Being Green
Black - Creek W						
Golden - Crown W		1	0	0	1	1
Reds - Walnut R				1		
Callowal R				1/2		1/2
Reds - Walnut R				3	1	
Reds - Walnut R				22	1	1

Reds - Walnut R  
 Reds - Walnut R

23

18

8

2

12

	Old Buds	Imm Hatch	Chickens	Young	Young Banded	Young Jewet
Proven Corp	<p>    </p> <p>    </p> <p>    </p> <p>    </p>	<p>    </p>	<p>   </p>	<p>  </p> <p>5</p>	<p>    </p> <p>    </p> <p>    </p> <p>    </p>	<p>    </p> <p>    </p> <p>    </p> <p>    </p> <p>142</p>
Joets Corp	<p>    </p> <p>    </p>	<p>    </p>	<p>   </p>	<p>  </p> <p>25</p>	<p>   </p>	<p>    </p> <p>10</p> <p>15</p>
Silver-Throat	<p>    </p> <p>    </p> <p>    </p>	<p>    </p>		<p>  </p> <p>2</p>		<p>0</p> <p>2</p>
Yellow-Webs	<p>    </p> <p>    </p> <p>    </p>	<p>    </p>	<p>    </p> <p>* FN</p>	<p>   </p> <p>29</p>	<p>    </p>	<p>    </p> <p>16</p> <p>45</p>
Yellow-Throat	<p>    </p> <p>    </p> <p>    </p>	<p>    </p>	<p>   </p>	<p>3</p>	<p>  </p>	<p>  </p> <p>4</p> <p>7</p>
Wicker's W	<p>    </p> <p>    </p> <p>    </p> <p>    </p> <p>    </p> <p>    </p>	<p>    </p>	<p>    </p>	<p>   </p> <p>21</p>	<p>   </p>	<p>3</p> <p>24</p>

## POSSIBLE CASES SOCIAL MIMICRY

- I Large conspicuous tyrant flycatchers of Central American region. Bright yellow breasts, striking black and white stripe pattern on breast. Species of the genera Megascops, Pitangus, Myiozetetes. References: SUTTON, G. M., (1951), "Mexican Birds", Univ. Okla. Press, Norman, Okla. STURGIS, B. B. (1928) "Field Book of Birds of the Panama Canal Zone", G. P. Putnam's Sons, N.Y. - London

## PARTLY SOCIAL MIMICRY?

- I Supposed examples of Mullerian or, more probably, Batesian Mimicry. The Black Warbler, Dendroica adsimilis, and a black flycatcher, Melanerpes formicivorus. Sparrow-birds and orioles. Reference: SHEPPARD, P. M., (1958), "Natural Selection and Heredity", Hutchinson & Co., London

HUXLEY, J.S. (1938) "Threat & warning coloration  
in birds, with a general discussion of the  
biological functions of color" - Proc. 2<sup>nd</sup>  
Int. Orn. Congr., Oxford, p 430-455

Use of word "episemantic"  
also stresses the fact that the same color  
pattern may whenever several different functions.

FRIEDMANN, H. (1935) "Bird societies" - from  
"A Handbook of Social Psychology", Clark  
Univ. Press, Worcester, Mass., U.S.A., pp 142-184

general survey of sociability in different  
groups

———— (1950) "The breeding habits of the  
Weaverbirds. A study in the biology of behavior  
patterns." - from the Smithsonian Report for  
1949, Smithsonian Inst., Washington, pp. 293-316

general survey. Philetanus particularly  
useful example

WING, L. (1946) "Species association in winter  
groups" - Auk 63, p. 507-510

## GENERAL REFERENCES

COTT, H. B. (1946) "The edibility of birds: illustrated by five years' experiments and observations (1941-46) on the food preferences of the hornet, cat and man; and considered with special reference to the theories of adaptive coloration." — Proc. Zool. Soc. London 116, pts 3 and 4, pp. 371-524.

States that "visibility" is a factor reducing vulnerability. (see also Mottram)

Also mentions that black & white are the most conspicuous of all colors.

MOTTRAM, J. C. (1915) "The distribution of secondary sexual characters amongst birds, with relation to their liability to the attack of enemies." — Proc. Zool. Soc. London 1915, p. 663-678.

### More Notes from Cott.

"Flash colors" are "procrisematic" according to Huxley, 1934 and 1938.

White color of sea-birds. Called "synprocrisematic" by ~~Armstrong~~ Cott

ARMSTRONG, E. A. (1946) "The coloration of sea-birds" — Birds of Britain, 2, p. 15-19.



DARLING, FF (1952) "Social Behavior and Survival" — *Auk* 69, p 183-191.

Lists some advantages of gregarious feeding and communal defense against predators

CONDER,

## SOME ADAPTATIONS INVOLVED IN THE DEVELOPMENT OF GREGARIOUS HABITS

A bird usually reacts to the presence of other birds by showing several contradictory and more or less "incompatible" tendencies. It is often partly hostile and partly "friendly", apparently wanting to join the other birds, and also attack them and/or escape from them at the same time. The resolution of such conflicting reactions is a particularly difficult problem in highly gregarious species, which have had to devise methods of both increasing the general social or flocking tendencies and controlling the hostile responses which are provoked by any close association of different individuals, (it seems to be very difficult, i.e. very disadvantageous, to dispense with hostility altogether). Most gregarious species have evolved specialized adaptive behavior patterns in order to attain both objectives.

The patterns which help to promote flocking are usually obvious and relatively simple. Almost all the highly gregarious species have developed special social calls, conspicuous wing and/or tail movements, and (very frequently) increased general mobility or "restlessness", all of which seem to be designed to increase the attractiveness of a social group and maintain cohesion within it. Some gregarious species have developed such characters without greatly altering the "hierarchy of instincts"; but others have also evolved a special, and more or less independent, "general social" drive or instinct which is not found in more solitary species.

The control of hostile responses would seem to be a more complicated matter in some respects, and has been achieved by a greater variety of methods. Some species have evolved special displays (ritualized social signals) which may be used by one bird of a group to reduce the strength of the internal attack and/or escape drives of other members of the group, while other species have developed displays which help to divert the overt expression of hostility within the group into relatively harmless channels. The overt expression of hostility may even be reduced without the intervention of special displays, by directly reducing the response to certain particular types of hostile stimuli (without weakening the internal hostile drives in general). Some species may use different methods in different circumstances; and these variations would also seem to be adaptive, in some cases at least, as they can be correlated with particular factors of the external environment.

THE ADAPTATION INVOLVED IN THE DEVELOPMENT OF GREGGARIUS HABITS

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## CLASSIFICATION

As there seems to be some evidence that Diglossa may be related to Couirostrum, I have looked at several species of Couibills in the USNM. The plumage of the ♂'s of some Couibills is surprisingly bright, with considerable black and/or iridescent blue, although the actual patterns are not particularly reminiscent of any Flower-piecers I know. There seems to be considerable sexual dimorphism in all or most of the species of Couibills in which the ♂'s are brightly colored. The ♀'s tend to be much duller.)

Below are descriptions of the brightly colored ♂'s of 3 species of Couibills.

1. sitticolor Black head & throat, blue back, rufous breast and belly.

2. albifrons Generally black, with a white forehead, and blue on the back and upper wing-coverts.

3. atrocyaneum. Generally black, with blue on crown, back, scapulars, and upper wing-coverts.

## Gregarious

Relatively little aggressive

hostility actually reduced

A relatively large proportion of hostility expressed by display

Relatively few distinct types of display

Some special types of displays (e.g. mimetic)

## Non-gregarious

Relatively aggressive

Hostility not reduced

A relatively smaller amount of hostility expressed by display

A relatively large number of distinct types of display

Few or no special types of display

## CLASSIFICATION

The tanagers, as a whole, would seem to fall into the following major groups:

I Euphonia. Quite distinct

II Blue and Green Tanagers. Usually, but not always, with some bright (frequently iridescent) blue or green in plumage. Also frequently black. Sometimes bright red or yellow. Very few species with dull plumage. Sexes apparently always essentially identical.

Tanagra

Chlorochrysa

Pirriidea

\* Tangara

Troglodytes

Dolichopteryx

Stephanophanes

\* Pseudotroglodytes

Bangsia

Butor

\* Dulcivora

Cyanocoma

\* Tyrannus

chlorurus?

2

III Red and Yellow and Black Tawazers. Much more varied, although less successful, than the Blue & Green Tawazers.

The typical members of this group are brightly colored, with large areas of red, orange, yellow (and, less frequently, white), usually contrasted with black. In almost all these species, there is strong sexual dimorphism, the ♀'s being noticeably duller than the ♂'s.

There are also a few members of this group in which both sexes are dull, usually grayish or olive, and identical with one another. They might be considered "hen-feathered" species.

None of the species in this group has bright blue or green in the plumage.

In addition to the more or less typical members of the group, there are a number of other, more or less aberrant, species which may be attached to it.

A. Typical Members of the Group.

- Spindales
- \* Rhampocelus
- \* Piranga
- Phlogothraupis
- Calochaetes
- Chlorothraupis
- \* Halia.

B. Almost Certainly Members of the Group

- Lanio
- \* Dactylopius
- Heterospingus
- Eucometis

- \* *Phaedonocichla*
- \* *Mitrospingus*
- Calyptorhynchus*
- Phaenoplerus*
- Neospingus*
- Compothraupis* ?
- Sericospiza*

IV Honeycreepers Quite another problem!

V Warbler & Finch-like Tanagers Probably extremely miscellaneous

- \* *Chlorospingus*
- Cremnospus*
- Neospingus*
- Neothraupis*
- Hemitraupis*
- Chrysothlypis*
- Erythrothlypis*
- Thlypopsis*
- Pseudospingus*
- Microspingus*

VI Very problematical genera. Also obviously miscellaneous

- Cyanicterus*
- Orthogonys*
- Neurgops*



Malacothraupis

Trichothraupis

Cypsuaga

Pyrrhocomma

Neosora

Troteraupeis

Croothraupis

Tauprosopia

Orchesticus

Oreothraupis

Schistochlamys

\* Cinopus

Polar Nucleus Species

Green-winged Teal

Arctic Nucleus Species

Red-winged Blackbird

Blue Jay

Green Heron

Temperate Nucleus

Red-winged Blackbird

Summer Tanager

Subarctic Nucleus Species

Red-eyed Vireo

Parula

Subarctic Nucleus

Summer Tanager

White-eyed Vireo

Euphonia

Saltator

Regular Pacific Nuclear Species

Brown-capped Bush-tanager

Regular Central Nuclear Species

Yellow-thighed Tanager

Wilson's Warbler

Collared Redstart ?

← ? footy cap.  
Black-chub W.  
Golden-crown W.

Regular Associates

Rufous-fronted Tanager-gleaner

Other Tanagerids ?

Toucanet ?

Yellow-throated Bush-Tanager

Slate-throated Redstart

Summer Tanager ?

Robin ?

Occasional Associates

Yellow-throat

Speckled Tanager ?

Flame-throated Warbler ?

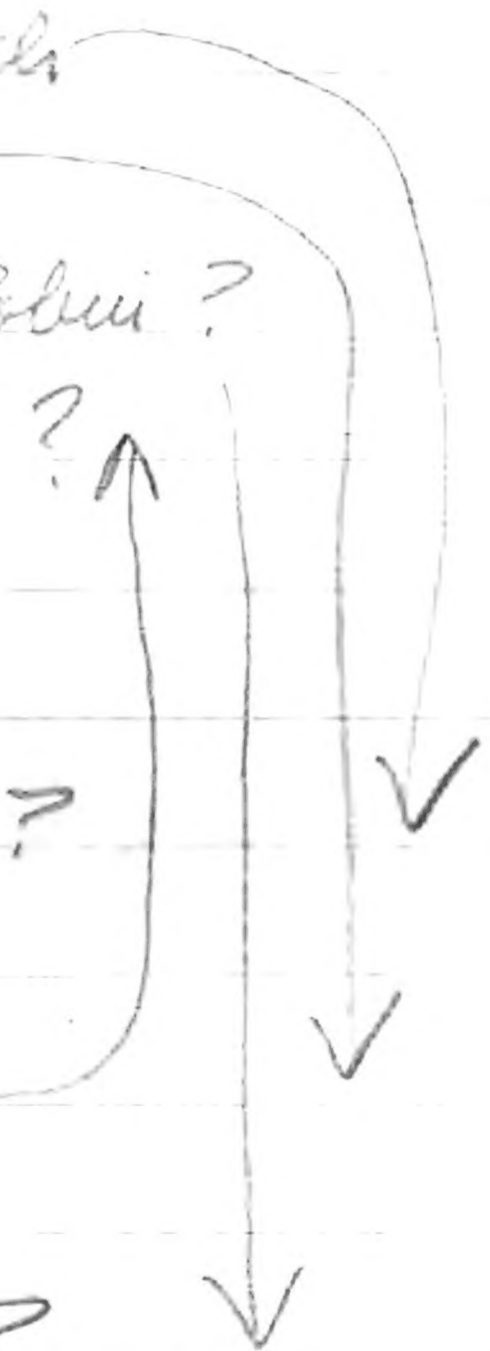
Pepper-shrike

Crown-capped Vireo

Green Toucanet

Long-billed Parrot ?

Flame-colored Tanager ?



Description of supposed Rufous-bellied Tanager

Female rufous

Back of neck (= crown?) grayish

Light streak behind eye

Generally buffy underneath

Tail and wings (not rump) bright rufous

Mixed Flocks

Isla del Rey  
June 2, 1957

Arrive ca 7:30 a.m.

Lots of BB Grackles, several streaked Saltators, one pair of Sangre seen almost immediately.

8:00 a.m. Lots more Sangres. A large party of RLBH's (at least 3♂'s and 3♀'s). And more streakeds. Not really associating with one another, altho all in same area.

8:05. First BT seen. Alone but in same area.

Some BG's around

1:00 p.m. I have still to see any PT's or PCT's around. The absence of PT's is particularly surprising, as there are lots of coconuts and other palms around.

As a result of the absence of these 2 nuclear species, there are no "real" mixed flocks around. Lots of associations between different species, but all seem to be purely "casual".

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## MIXED SQUIRREL-BIRD FLOCKS

Mountains above El Valle - Sept 8, 1962. A large mixed flock of birds, including ant-birds and at least one tree-creeper. With a reddish squirrel (perhaps the usual lowland Red-tail) near the center. Birds obviously not mobbing the squirrel.