

Chlorophanes, I

①

November 30, 1957,
Barro Colorado

This species may not be uncommon around the clearing on the island, but it is certainly not conspicuous. I have seen a number of ♂'s (all adult in complete plumage, except one bird, presumably immature, in which the black of the head was very "spotty") in both moderately low-vegetation and the tree-tops. Always solitary. One came to "visit" the captive birds very briefly once, without doing anything of interest, but otherwise they have been very aloof.

Chlorophanes, I

December 1, 1957
Barro Colorado

A ♀ just showed up to "visit" briefly. Gave a "tsit" CN as it flew away. Otherwise no display of any kind.

Chlorophanes, I

December 21, 1957
Barro Colorado

Trapped one ♀ today (banded red right), and released her in the aviary.

She was, and still is, quite nervous. Flying about quite a lot. Surprisingly enough, she is quite silent during this flying about. Even after being in the cage 4 or 5 hours. Blue Honeycreepers of both sexes moved certainly after lots of

Chlorophanes, Dec. 21, 1957, II.

CN's and/or HCN's in similar circumstances.

Once, soon after being let loose, she panned, sat for a few minutes, and uttered a lot of single, rather loud "Tut" notes, (bill opening & closing with each note) from a perfectly unutilized sitting posture.

I have heard wild birds utter similar "Tut"s, when sitting, and (I think) when flying by me.

The fact that the captive ♀ did not utter "Tuts" when flying around would suggest that they are all CN's and not ordinary CN's.

I have seen no trace of a distinct CR pattern like that of the Blue Honeycreepers.

The captive ♀ has the usual tanager WF's and TF's.

When she was flying about at her nest visited, she gave several distinct G's (revealing yellow inside mouth) when she landed, momentarily, particularly near me.

Chlorophanes, I

December 23, 1957,
Barro Colorado



The captive ♀ is not very active, much less so than the Blue Honeycreepers, or the Euphonia's (at least in the morning).

Tends to sit a lot, all fluffed out, looking very large bodied.

and relatively small-headed.

When she does have periods of flying about, she often assumes the posture drawn above before flying up. (This may help

Chlorophanes, Dec. 23, 1957, II

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to explain the evolution of the st. of the Blue Honeycreepers — although they don't assume this posture as a pre-flight pattern nearly as often as Chlorophanes.) In the case of this ♀ Green Honeycreeper, at least, this pre-flight "bill-up" posture does not appear to be ritualized in physical form.

This ♀ is still largely silent when she flies about, although she does give single "Trit" 's from time to time. Most of her "Trit" 's are given while she is sitting still. This afternoon, I couldn't detect much hostility while she was "Trit" -ting. The notes looked very much like the results of frustrated gregariousness or sexuality.

The ♀ often does OCB (slower than that of gulls), and rapidly extends & withdraws the tongue repeatedly, in circumstances of "stew". This may be more than coincidence.

Chlorophanes, I

December 28, 1957

Barro Colorado

I saw that the captive ♀ just opened its bill wide and uttered an absolutely mechanical, rattling rattle, when another bird came too close. No ritualized postures or movements.

An adult ♂ in perfect plumage came to visit the captive ♀ this afternoon. I tried again & again to get into the aviary. Almost completely silent, just a few "Trit" 's from time to time, and I couldn't be sure what stimulus provoked them.

Chlorophanes, I

December 30, 1957

Barro Colorado

Chlorophanes, Dec 30, 1957, I

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Caught a new ♀ Green Honeycreeper today. Banded white right. Put in aviary.

When I was taking it out of the net, it uttered a lot of hoarse harsh notes. Possibly HAC, but rather loud. Sometimes single, sometimes in series of up to 3 or 6, but the series were never organized into distinct units.

When I put it into the aviary, both it and the earlier ♀ were rather excited, flying about. Both of them uttered some "Trits", but were comparatively silent on the whole. Both of them also did a lot of G-ing, but it was difficult (as usual) to determine if this was really a ritualized signal. They may simply have been a reaction to the exertion of flying about — but, if so, this species "parts" much more easily than any of the others I am studying.

I did notice that when another Green Honeycreeper came to "visit" both the captive birds started to fly about and give "Trit"s at moderately frequent intervals. The captive birds and the wild bird seemed to be responding to one another, calling back & forth.

The 2 captive ♀'s are really having nothing to do with one another.

Chlorophanes, I

December 31, 1957,

Barro Colorado

A wild ♂ and several ♀'s have come to visit the captive ♀'s this morning. Most of the visitors have not done much, just "Trit" Notes & Hubs. One of the visiting ♀'s,

Chlorophanes, Dec 31, 1957, II.

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Became very excited, flew back & forth, uttered a lot of Trits and did a lot of Flicking. Twice again she also uttered a very loud mechanical sounding Rattle (much louder than the one I heard the captive ♀ give a few days ago). Like a lot of Trits run together. The bill vibrated or opened & closed very rapidly in unison with the Rattle Notes. I think that the lower mandible vibrated more than the upper. In any case, the yellow on the lower mandible and inside the mouth flashed conspicuously during the Rattle. It was not, however, accompanied by any other particular or peculiar ritualized posture or movement (except for Flicking, of course). I think that the Rattle must be a hostile pattern, probably threat.

There were a few calls which seemed to be nicely intermediate between the Rattle and the ordinary Trit. A single Trit note, followed immediately (like an echo) by 2 or 3 Rattle Notes.

The full Rattle must include at least 10 or 15 notes.

The whole Trit - Rattle complex is rather reminiscent of the trillers of the genus Tougar.

I have now seen a visiting ♂ give a full Rattle just like that of the visiting ♀ earlier. Again without ritualized postures or movements.

Chlorophanes, I.

January 2, 1958,
Barro Colorado

Let us call Rattle R.

Chlorophanes, Jan. 2, 1958, I

I have heard lots of R's given by the 2 captive ♀'s this morning when there were no wild birds around. Probably some of them provoked by other species in the aviary. Another indication that it may be a purely hostile pattern.

A wild ♂ came to R'd at the captive-birds very briefly this morning. Much as before. I did notice, however, that his tail vibrated in rhythm with the call, and that his head-feathers, although not ruffled at all, were perhaps slightly fluffed. Anyhow, from the front, the whole head (except bill, of course) looked completely black, comme ça:



Yes! I have just seen one of the captive ♀'s give an R while attacking a Euphonia over food.

So far this species seems to be remarkably unlike the Blue Honeycreepers.

The R can certainly be given in flight.

Several more cases of captive ♀'s using R when attacking other birds over food. Must certainly be relatively very aggressive.

This afternoon I caught an adult ♂, banded light blue right. Perfect plumage.

When I put him in the aviary, he didn't do much except fly about excitedly, very scared. Settled down quite quickly, but relaxed at the same time. Not interesting.

The 2 captive ♀'s also flew about excitedly when he was put in. Both did a little R, but the white right ♀

Chlorophanes, Jan. 2, 1957, II

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did much more than the other ♀. Some of her R's were directed toward the new ♂, but most of them were directed toward birds of other species. As she did much more R at this time than she or the other captive ♀ has ever done before, I presume that a lot of her R was redirection.

Later on a wild ♂ came to visit the captive birds and behaved in a way I have never seen before. Quite silent. Most of the time spent with the back and breast and belly feathers very fluffed, really ruffled. Part of the time this "Gfluff" was combined with obviously unutilized flight int. moos. Part of the time it was combined with a sort of "upright alert" posture. The latter combination I shall call the V'Gfluff. Very striking, common.



Fore head high.
Head & neck sometimes inclined forward also.

All this Gfluff (both with V and without) was combined with very frequent and extreme flinking of the usual type and all sorts of comfort movements: i.e. preening (breast & over shoulders), scratching (side of head), wing shaking or vibrating (rare), bill-wiping (common), and rubbing the side of the head against a twig. Also CB, and a sort of rapid pushing in and out of the tongue.

The ♂ inside the cage behaved in the same way.

Alorophanes, Jan 2, 1958, III.

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with lots of flicking and comfort movements, but without any signs of the Gfluff (perhaps a slight trace of V or alert posture, but not much).

I presume that this whole complex of patterns, or at least much of it, was less aggressive than the previous hostile encounters I have seen. No R. Presumably the 2 ♂'s were somewhat frightened of one another. (This is the first hostile encounter I have seen, in which 2 ♂'s were involved).

Another visiting ♂ just showed up, and again displayed toward the captive ♂ with V Gfluff and associated patterns. Just as before. (But I think that the bill is usually, perhaps inclined slightly upward during the extreme V Gfluff - although this varies greatly, according to the position of the opponent, and the strength & frequency of the accompanying comfort movements. A ♂ in V Gfluff will often look down, like the "Bill-down" of larks, in what is apparently an int. mov. of bill-wiping, or preening, or something). Then a second visiting ♂ showed up while the first was still present! The 2 visiting ♂'s then went flitting off into the trees, hopping excitedly from twig to twig, and fluffing each other in V Gfluff every time they landed!

The captive ♂ responded to the visitors as before, except that this time he once went into a V Gfluff in return, and, later on, gave an R (with perhaps a slight trace of Gfluff - but nothing more).

After the 2 visiting ♂'s had gone, another ♀ came to visit. She just did R without any ritualized postures or movements except flicking.

Chlorophanes, Jan. 2, 1958, IV.

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Getting the birds in the aviary has been a revelation in one sense. They do not seem to be gregarious in the wild. (I have never seen more than 3 wild birds moderately close together in the wild, and that mainly very rarely). But the capture birds certainly do seem to have the power of "attraction", pulling in lots & lots of visitors, some of them probably repeatedly. (I might add that I have also caught another visiting ♀ today, which I shall let go later on.)

Before I forget completely, I should add that the "obviously unritualized flight int. movs." with which the visiting ♂'s have combined the V-gloss as nothing more than a flexing of the legs and a stretching forward (and sometimes downward) of the head & neck.

Another visiting ♀ has just appeared, and has sat for some minutes now on a branch just above the aviary. In perfectly relaxed, rather hunched, sitting posture, uttering "Tut" Notes at not too infrequent intervals. So these "Tut" Notes can't be a sign of great alarm.

Another ♂ coming to visit!! Behaving just as before. The capture ♀'s are certainly dominant over the capture ♂ at present. They can always force him to retreat, by a simple supplanting attack or a supplanting attack & R.

The capture ♂ has behaved like the ♀'s insofar as he has given few or no "Tut" Notes.

Another visit by a ♂!! Behaving more or less as before. I notice that OCB and "Tongue pumping" are almost constant during the V-gloss by the visitor this time.

Another visit by a ♀, who does nothing at all.

January 3, 1957
Barro Colorado

I have caught 2 more adult ♂'s this afternoon, and put them in the aviary. Banded yellow right, and black left.

When I put them in the aviary, they did nothing but fly about in the usual escape reactions. No sign of R or Gfluff. Possibly no "Ints" — certainly very few. Would seem to indicate that all these reactions need some appreciable attack drive in order to be produced.

In general, all the captive Green Honeycreepers, ♀'s as well as ♂'s, seem to try to stay as far away from one another.

I have seen more cases of ♀'s attacking other birds with soft brief R's. And one case of a ♂ wrapping with a similar R!

I think there is a morphological distinction between low-intensity and high-intensity R patterns. The shortest R's are softer, lower-pitched (?), with less visible vibration of mandibles — I think — than the longer R's. I have also heard some long R's which began in an apparently "low-intensity" way, and then developed into the apparently "high-intensity" type — so it is possible that the differences between the 2 types are the result of differences in relative aggressiveness.

I am almost sure, now, that the so-called "gaping" of this species is not a ritualized display.

The posture of a perfectly relaxed bird, half asleep, is very fluffed, but it differs from the Gfluff in that the lower back and rump feathers are perhaps the most fluffed of all.

January 4, 1958
Barro Colorado

My My! The red right captive ♀ has become unbelievably aggressive this morning. Attacks every other honeycreeper and Euphonia who comes anywhere near the food dish. Sometimes chases them back & forth (particularly the ♂ Green Honeycreepers). Usually ignores the finches, even when they come very close to the fruit dish (more than close enough to provoke vigorous attack were they fruit-eaters).

All these attacks were essentially supplanting. Either silent or with brief "low intensity type" R (call this SR). In other words, the SR is not really a relatively low intensity pattern, compared with the longer, louder R's (LR), but only a sign of relatively weak conflict — can occur when the attack drive is relatively very strong.

None of the other Green Honeycreepers has fought or displayed back at all.

My God! What a day! This fighting continued for a few minutes more, when I suddenly noticed that 2 ♂'s were on the floor of the aviary. Either exhausted, or injured, or suffering from stroke. The yellow right & black left ♂'s. I picked them up and tried to restore them, but they both died very soon! So I took the red right ♀ out of the aviary, and put her in a separate cage — whereupon the white right ♀ began to behave in just the same way! Chasing all the fruit-eaters on sight! So I took both the remaining Green Honeycreepers out

Chlorophanes, Jan 4, 1957, II

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I the aviary and put them in the cage with the real right ♀. Whereupon the red right ♀ started to chase the white right ♀ unmercifully (rather ignoring the remaining ♂, thank God!).

I heard one of the ♂'s give a hoarse, harsh note, like the notes given by birds in the net when handled, when escaping from one of the attacking ♀'s in the aviary! Sounded just like the HAC of other species, but I shall call it HC. Similar notes were uttered when the red right was chasing the white right in the small cage. And there was a whole burst of such notes when the 2 ♀'s got involved in a real huck-down and drag-out fight. This pattern must be very high intensity! And probably contains a very strong escape component.

God alone knows what started this elimination bout this morning! It may be that the birds were merely getting used to the aviary. Or, perhaps more probably, it may have been a sudden upsurge of "reproductive" behavior. It was very cold & rainy all morning long — much more so than it has been for weeks (at least) — and the birds may have thought the rainy season was starting again or anew. (See also today's notes on Cyanerpes).

No wonder these birds don't appear to be very gregarious when seen in the wild!

It might be noted that one or more of the surviving birds is now uttering a lot of "Tsit" Notes in the new-small cage.

It might also be noted that I saw very few, if any, "erect alarm" postures during all this hoo-ha-ha. The flight-cued birds usually sat hunched, with head & bill pointing forward.

Chlorophanes, I

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January 8, 1958
Barro Colorado

Everything seems to be moderately quiet in the small cage. The 2 ♀'s and the surviving ♂ (with injured wing) are getting along more or less all right, with lots of supplanting attacks, a few fights, quite a bit of R and "Trit"'s ♀'s are still strongly dominant.

I have been watching Flicking in these birds too. Quite variable, as usual, but more or less like that of the Blue Honeycreepers. Lots of quite extreme WF. Very little TF, and that possibly unritualized. When it does occur, essentially or completely a short lateral movement, usually a continuation of a body movement four times a slight vertical component, usually U-D, perhaps sometimes D-U.

January 15, 1958,
Barro Colorado

Chlorophanes, I

Today I watched a wild ♀ chase a wild ♂, when a whole flock of birds (of many species) was feeding in a Cecropia. She gave R as she attacked, and the ♂ fled immediately. This is one of the very few cases of overt aggression I have seen among the wild tanagers - so far.

Chlorophanes, I

January 23, 1958,
Barro Colorado

Nothing very new or spectacular recently.

Chlorophanes, Jan 23, 1958, I

(14)

Wild birds still come in to visit the captive ones from time to time. A ♀ came in this morning, and did the complete Vgfluff pattern just like the ♂'s described on Jan 2, p. 7. With lots of WF, as apparently usual in this pattern (But very little and very un-exaggerated TF - is this also usual? I think perhaps no.) Also with lots of BW and purring-in-and-out of the tongue.

This is the first of the very numerous ♀ visitors I have seen do this. It is probably significant that she did this when I was not near the cage (I was watching from the top of the hill) - the only ♂'s I saw do this pattern also did it while I was away (in the house). This would certainly suggest that the pattern cannot occur when the escape drive is as strong as it always is when a human being is present.

Chlorophanes, I

February 1, 1958
Barro Colorado

Watching a whole swarm of honeycreepers, both green & blue (see today's notes on Cyanerpes), disputing in the Bahia by Chapman House. At least 2 pairs of Greens, fighting among themselves and also attacking all the Blues, chasing frantically round the tree. The whole dispute lasted about a half hour. The Green ♂'s did a little Vgfluff and a little R during both the inter- and intra-specific disputes, (the Vgfluff with lots of WF as usual), but ritualized patterns in general were rare as attacks or supplanting attacks were relatively seldom resisted.

As far as I could see, during this particular dispute, the aggressive Greens hardly seemed to discriminate at all between Blues and other Greens.

February 4, 1958
Barro Colorado

Well! Another terrific rain storm last night, and one of the captured ♀'s, white right, drowned!

I watched the wild Green Honeycreepers in the Balsa tree by Chapman house again this evening. Quite a lot in the tree, more than I have ever seen so closely associated in the wild before (there were at least 3 ♂'s and 1 ♀ in the tree at one time), but they were all certainly hostile to one another. Lots of disputing, like yesterday; and it was obvious that this wild ♀ was also dominant over all the wild ♂'s, being able to chase them all away without any trouble. These disputes were obviously territorial, each bird defending a particular part of the tree.

The most interesting hostile performance this evening was a whole lot of "Trit" Notes. Perhaps started by a ♂ near me, perhaps as a reaction to my presence. Anyhow, all the birds soon started to give "Trit" Notes at moderately frequent intervals. They seemed to be answering one another back and forth, and the whole thing seemed remarkably similar to the bursts of HCN's which flocks of Blue Honeycreepers not infrequently indulge in.

This "Trit" Note pattern may contain a more or less strong escape component, but escape can't be predominant. It is seldom or never accompanied by overt escape, and escaping birds during these disputes are usually silent.

The Green Honeycreepers tonight also defended their territories against intrusion by Blue Honeycreepers.

February 5, 1958
Barro Colorado

A ♂ in Balra Tree, obviously annoyed at the landing of another pair a few yards away gives R after R in an apparently perfectly relaxed posture *conno sa*.



Rump definitely
bluffed.

This seems to be significant because the ♂ made no effort to attack the "intruders"; i.e. it would suggest that the attack component is not overwhelmingly predominant in the R, and that the R can occur at generally low intensities.

Lots more fighting in the Balra Tree later on, as usual, but I can add a few new facts and confirm a few old suppositions.

Almost all this fighting takes the form of supplanting attacks & brief (& sometimes repeated) chases. Lots of R (I still think usually by the aggressive bird). No "Tits" this afternoon. Why? Relatively very few V Gfluff's, presumably because the attacked bird usually flies as soon as the aggressiveness of its opponent becomes apparent. The only V Gfluff's I have seen have been when 2 birds disputed more or less face to face for a second without escape. At least one the V Gfluff immediately preceded escape (No display after escape).

One ♂ chased a ♀ again & again, apparently dominant over her.

A ♂ Green Honeycreeper just made a supplanting attack on a Bananaquit, which fled immediately.

There was an actual fight, falling through air, between a ♂

Chlorophanes, Feb. 5, 1958, II

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and a ♀. Accompanied by irregular series of hoarse harsh notes. Presumably the same notes I described on Jan 4, page 12, which I am calling HC. Quite impossible to tell which bird was giving the notes during this flight, may well have been both.

Chlorophanes, I

February 16, 1958

Barro Colorado

I caught a new ♂ Green Honeycreeper yesterday morning. A young bird, just about completing the molt into adult plumage. Banded yellow left, and put in the large aviary.

The only thing he has done of interest was uttering a lot of "Tut" notes while sitting moderately alertly on a perch this morning.

A ♀ winter was attracted to the aviary this afternoon when I let loose 2 new Blue Honeycreepers and there was a general commotion (see today's notes on Cyanerpes). She didn't do anything really unusual, but I did notice that she uttered some of her R's from a very fluffed posture with head resting on shoulder, comme ça:



Notice characteristic head shape. This is always (?) present during fluffing of any bird when the bird seems to be "relaxed".

February 23 1958
Barro Colorado

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There hasn't been much new going on for a long time.
I keep catching more Greens (particularly young birds) in the trapping net all the time, (and let them go immediately). This would seem to indicate that the gregarious tendencies of this species are very strong (at least as strong as those of the Blues); but that they are normally thwarted, in the wild, by the even stronger, "hypertrophied", hostile drives - particularly attack.

An adult ♂ in full plumage came to visit this morning and demonstrated some facts particularly clearly. He did a lot of R, and proved conclusively, I think, that the R is both aggressive and very effective as threat. When he first came, he just stood and looked, and the young ♂ in the aviary just sat and looked back. Then the visitor gave an R - without other movements - and the young ♂ immediately dove down into the bushes out of sight! Later on the visitor flew around the cage, chasing a ♀ Euphonia in a series of short & obviously aggressive flights. He gave an R each time he started one of these flights!

This species does seem to have an ordinary CN in addition to the "Trit" Notes. I noticed the ♂ uttering these notes this afternoon (with opening & closing of the bill with each note) when he was just flying about the cage in a more or less "relaxed" manner. Sounded just like the "Trit"s, but very much weaker. It is possible that these ordinary CN's will eventually be shown to intergrade with the "Trit"s, but they certainly appear to be quite

Chlorophanes, Feb. 23, 1958, II

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distinct in their "typical" form.

Something most peculiar happened this afternoon, which I am not sure I was able to follow. Something was uttering single harsh, hoarse, rather short rasping notes (with less rattle undertone than the usual R). These might be transcribed as "Kraaa", and I shall call them Rsp. They were definitely associated, in time, with R's by the captive adult ♂. A few Rsp's occurred by themselves more or less alone (during a general period when R's were common, however), but the usual sequence was an R followed immediately by an Rsp. Sequences such as R-Rsp-R-Rsp" were also not uncommon. I think that these Rsp's must have been uttered by the captive adult ♂; but I must say that he didn't open his bill at all during the notes - nor could I detect any throat or tail movements! If this note actually was uttered by one of the Greens, I wonder if it is homologous or analogous with the Bzz's of the Bluebirds (which it rather resembled in sound, except for the fact that it lacked twang) or, possibly, some of the HCN's or WHN's of the Blues??

Chlorophanes, I

February 24, 1958,
Barro Colorado.

The young ♂ in the large aviary apparently began a R-Rsp complex performance this morning just when a pair of Bluebirds came to visit. Much as yesterday, alternating R-Rsp-R-Rsp-R-Rsp-Rsp etc. Again absolutely no outward sign that it was this particular bird who was giving

Chlorophanes, Feb. 24, 1958, II

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the Asp Notes. Most peculiar still!

Actually some of the R's associated with these Rps were rather peculiar in quality. Much softer & probably somewhat slower. More like the ordinary N's in tone. Given with very little opening of the bill. I presume that there are just some sort of variant of the ordinary R (and some quite typical R's were certainly associated with some of these Rps), but I don't know what their significance might be.

Actually, of course, I still have no idea what the peculiar motivation of the Rps might be. Presumably hostile, but how, and just how much??

Chlorophanes, I

March 7, 1958

Barro Colorado

I have now seen several wild ♀'s emit the ordinary and so pronounced G's. This occurred in cool weather, when the birds hadn't been very active, so it couldn't have been a form of "panting". Must be a ritualized display.

Chlorophanes, I

March 12, 1958

Barro Colorado

The capture of Green was sitting far apart from the ♀ in the cage this morning when he suddenly went into a long & complex vocal performance, obviously related to some of the R-Asp performances described above, but rather more elaborate.

Chlorophanes, Mar. 12, 1958, II

(21)

Essentially composed of long R's, and lots of Rsp's — many more Rsp's than R's, jumbled in no apparent order, with many Rsp's occurring without preceding R's. Some of the Rsp's were preceded by ordinary CN's. Others just occurred in series by themselves, e.g. Rsp-Rsp-Rsp. The intervals between all notes of all kinds seemed to be quite variable (except that the Rsp's tended to follow the other notes very rapidly when they did occur after notes of some other kind — the Rsp often sounds like an "exhalation", a letting out of breath after the "inspiration" necessary to produce other notes.)

I think I shall call complex vocal performances like this (and the R-Bzz performance of the first capture of flaming Honeycreeper) "Compound R songs" (CRSng).

Chlorophanes, I

April 10, 1958

Barro Colorado

Watching a ♂ in a very large very mixed species flock. Not very interesting, but I did note that it uttered lots & lots of simple R's without any attacks or other birds. So the R can't always be very aggressive.

Chlorophanes, I

April 19, 1958

Barro Colorado

The captive birds did something peculiar today, which happened so rapidly that I could hardly follow it.

Chlorophanes, Apr. 17, 1958, I

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The ♀ was just sitting on a twig near the top of the cage, in a rather hunched, rather fluffed, posture. The ♂ was down below, probably feeding. Suddenly he flew up to her, landed beside her (parallel and more or less facing in the same direction), and leaned over her, in a very tall, thin-necked posture, with head & bill more or less horizontal, belly feathers more or less fluffed (i.e. in at least a trace of the V-guff). Then he sort of jabbed his bill toward her bill, she turned her head so that her bill met his, and then he suddenly flew away.

I think this was an attempt, possibly successful, of the ♂ feeding the ♀.

The actual "feeding", i.e. the period when the birds were together, was quite silent, but the ♂ uttered 3 or 4 notes, in a rapid series, just before he flew up to the ♀. Like "Tut" notes, but softer, less sharp, somehow slightly more pleasant and melodious.

Chlorophanes, I

May 5, 1958
Barro Colorado

I have now caught brief and unsatisfactory glimpses of several more cases of the capture of feeding the ♀. Still haven't seen any special preliminaries, if there are any; but it is obvious that the ♂ does not usually make any call beforehand. Nor does the ♀.

I have now heard the ♂ give a brief R - Rsp - Rsp - Rsp - Rsp performance. Apparently provoked by, and directed toward, some outside stimulus. This incident

Chlorophanes, May 5, 1958, II

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||| would seem to definitely prove that the Ksp is physically (at least) an independent pattern.

Chlorophanes, I

August 3, 1958
Barro Colorado

||| Both ♂ and ♀ wild Green Honeycreepers have been coming in to visit the captive Plain and Golden-winged Tanager in the large aviary. Probably attracted by the CW's and CWG's of the tanagers. See also today's notes on Shining Honeycreepers.

Chlorophanes, I

June 13, 1962
Barro Colorado

||| My old captive ♀ died a year ago. Since then the captive ♂ has been kept in a cage by himself. This morning I shall put a new captive ♀ in with him. This new ♀ has been in a cage by herself for some months.

||| ♀ put in 6:10 a.m. Both birds quit feeding

||| 6:15 ♂ starts to move around a little. Not near ♀.

||| Utters occasional loud single "Tut" Note

||| 6:20. No change. ♀ just sitting & looking. ♂ keeping as far away from her as possible. In exactly opposite corner of cage

||| 6:25 Boca pulls up old food. Both birds fly about a little. Silent. Then ♂ utters more single loud "Tut" Notes. ♂ continues to utter "Tut" Notes after Boca leaves. ♀ just sits silently

6:27. ♂ suddenly starts to utter longer notes Obviously closely related to "Tut" but could be transcribed as "Tsect"s. In moderately rapid series. Then flies to same branch ♀. "Tsect"s accelerating. In trace of VG-Hff. "Tsect"s accelerate into brief R as ♂ slides down branch close to ♀. Then R stops, ♂ utters one or more "Tsect" notes again, still in slight VG-Hff, leans toward ♀, and touches her bill with his !!! This looked like an attempt to feed the ♀, but the ♂ certainly did not pick up food beforehand. ♂ silent when actually touching ♀. ♀ just pecks toward him. Also quite silent. Then ♂ flies off. Resumes behaviour as before.

6:35 The ♂ suddenly starts to approach the ♀ again and again. Repeated cop. attempts. Between 6:35 and 7:10 a.m. there at least 22 such attempts !!! Working

up to a climax at the 12th attempt and then declining.



All the attempts were essentially similar in many respects, but there were a few changes as the series progressed.

All attempts were begun by the ♂ flying to the ♀. Sometimes the ♂ flew directly to the ♀. At other times he flew back and forth excitedly, for a few seconds before flying to the ♀. Direct approaches to the ♀ were relatively rare during the first 7 or 8 cop attempts. Usual during the later attempts. Sometimes the ♂ landed close

beside the ♀. At other times he landed some inches away from her, and then approached her more closely on foot. "Close landings" were usual during the later cop attempts; relatively rare during the early attempts. The ♂ never did any pivoting or bowing as he approached the ♀. He always showed a trace of VG Jff as he stood beside the ♀ and/or approached her on foot. Sometimes these traces were very slight (possibly not necessarily hostile - as the upward strutting of the neck might be nothing more than an intention announcement of mounting, and the fluffing of the underparts might be purely or primarily sexual in some cases). At other times the VG Jff was more extreme and more obviously hostile (sometimes accompanied by very frequent WF's as during disputes between rival males). Obviously hostile VG Jff's more characteristic of earlier attempts than later ones.

The ♂ always uttered several "Tsee" notes as he approached ♀. These were always uttered as he flew toward her. Sometimes also when flying back and forth beforehand. Sometimes continued while he stood right beside her immediately before mounting. Not continued during actual mounting, or resumed after dismounting.

These "Tsee" notes were similar to the "Tseet"s uttered before the feeding attempt described above, but shorter, less loud, probably slightly softer. Uttered in rapid series, but rhythm of series quite variable and irregular. Frequently more or less comme ça: — — — — —
— — — — — Something about the rhythm was quite reminiscent of "GHAC" of some other species.

These "Tsee"s must be primarily sexual. "Tseet"s obviously hostile. "Tseet"s morphologically intermediate between "Tsee"s and

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"Trit"s. (Conceivably, the "Trit"s might be strictly homologous with the PN's of other species.)

Sometimes the ♂ also uttered brief R's, usually in middle "Trit" notes, while approaching ♀. Apparently perfectly normal hostile R's.

The ♀ usually (always except during some of the very latest attempts - see below) went into an extreme BV-TV posture immediately as soon as ♂ showed any obvious intention of approaching her. A typical BV-TV is sketched (roughly) on p. 24. Bill always pointed strongly upward. Possibly sometimes approaching vertical. Tail always raised very high also. Breast lowered. Extreme belly-fluffing. During the first few attempts the ♀ kept her wings meeting on her back throughout the period she stayed in BV-TV. During the 7th attempt, however, I noticed that the wings were held out slightly (even before the ♂ attempted to mount). More or less horizontal. This holding out was even more extreme during the 8th attempt. Probably characteristic of almost all the later attempts. Wings always approximately horizontal. Probably or certainly spread to some extent. Absolutely no trace of Q by the ♀ at any time!!! Prominent of Rumpoculus!

The ♀ always remained quite silent throughout all the copulation attempts. She was probably, in fact, silent in all circumstances all morning.

The actual mountings were quite undistinguished. During most attempts, especially the earlier ones, the ♂ mounted more than once. 2, 3, or 4 times during a single attempt.

Post-cop patterns were somewhat variable. Sometimes nothing at all. Sometimes ♀ flew away immediately after an attempt. More often she remained where she was, and the ♂ flew away.