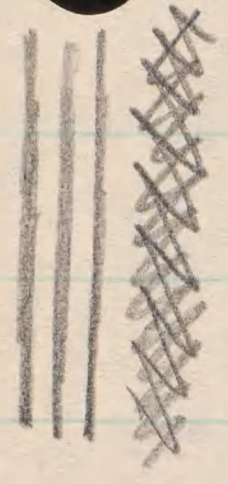


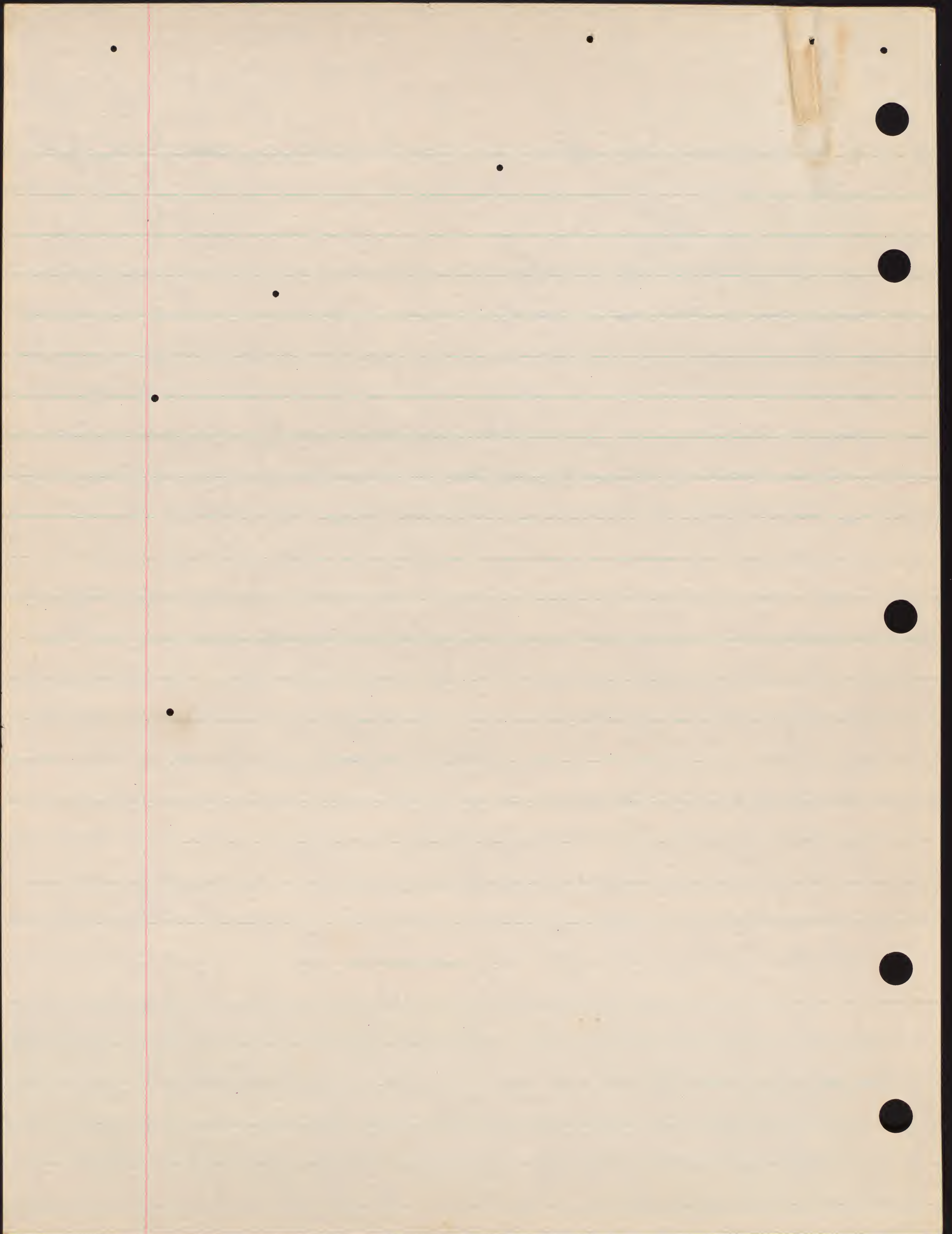
Cacajou rubicundus, I

November 18, 1965
Barro Colorado

This morning, I noticed that two of the juv. Uakarus uttered Purrers simultaneously. While they were sitting close together, both watching me intently, when I was only a few feet away from them.

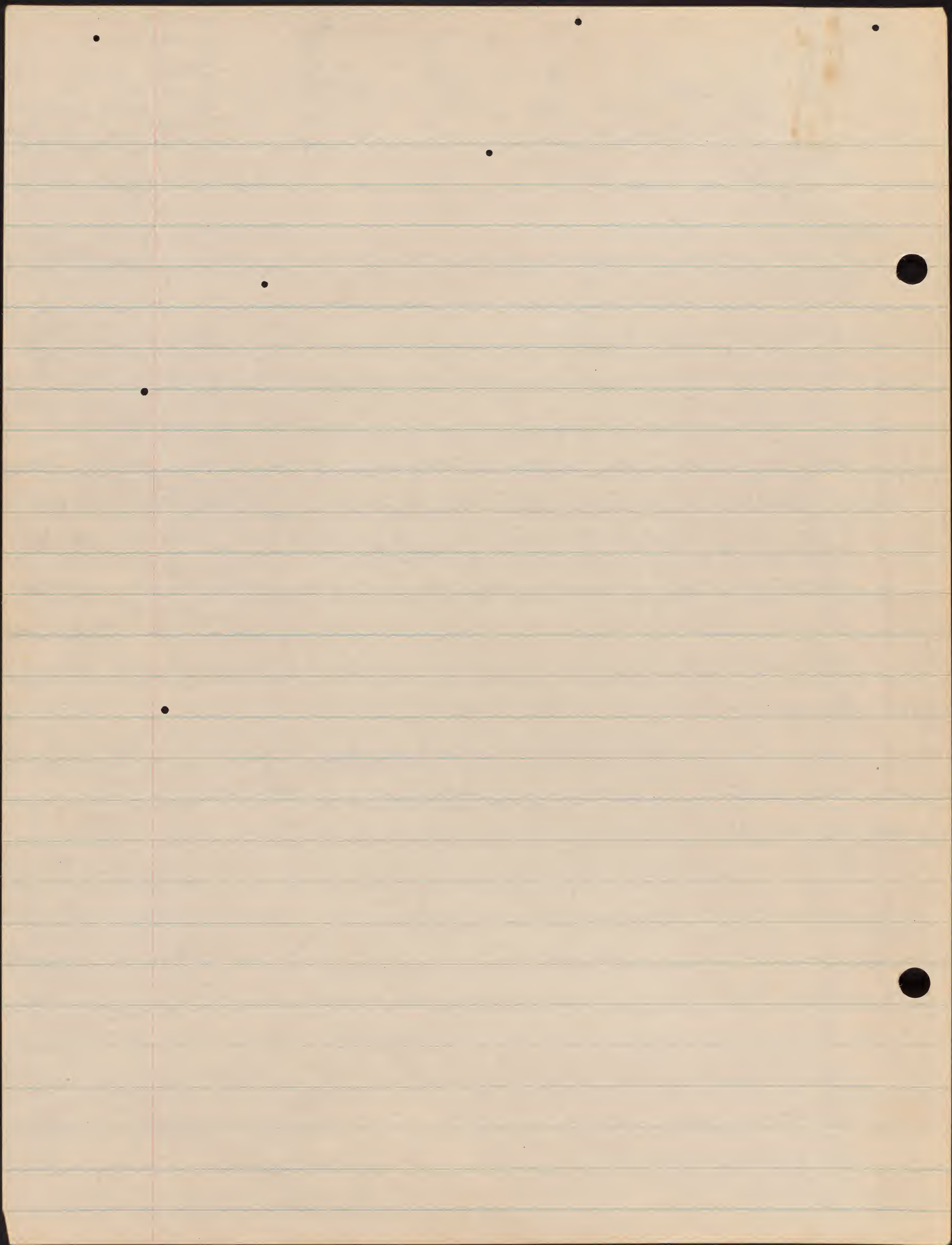
SEE ALSO TODAY'S NOTES ON PITHECIA.





CACATOU RUBICUNDUS

I



Caracou rubicundus

(1)

October 21, 1958
Washington Zoo

There is one Red Uakari here. About 3/4 grown I think
In a small cage with a single Squirrel Monkey.

Very "choosy" seeming in his selection of food. Seems to
manipulate the food more than any other monkey I have ever
seen. Using both hands, together & alternately. (also teeth)
Does not, I think, oppose its thumb very much during this man-
ipulation. I have also watched it climb a bit, and it hasn't
opposed its thumb for this either. Seems to flex all fingers together
sometimes more or less radially. These fingers move like warms
in fact. (This appearance may be slightly deceptive, however, as
the poor animal doesn't have any thin round branches in its cage
— just a ladder & rather large trunks.

It cleans its face by rubbing the muzzle along the ground,
or a trunk, or the walls of its cage.

It may have shown a little hostility toward me when I
first approached. Opened its mouth, and drew back its lips to
show its teeth. The mouth was only opened a little, but it was kept
open. Lower jaw seemed to move a little. Almost a trembling mot-
ion. Bumbly side to side ???

Three times during this, it stuck its tongue out quite far,
and kept it there for some seconds. The interesting thing was that
the tongue was put out sideways, out the corner of the mouth.

According to one of the keepers, this species is very bright
and inquisitive — always wanting to know what's going on.

Cacajou rubicundus

October 24, 1958

Brown Zoo

There are two full grown animals in a cage here. Outside, with bars, so I can hear the sounds they make.

Actually they only seem to make one sound, but they do that nearly continuously. Little series of notes, sounding like somewhat higher-pitched, more "whimpering", "MG" Notes of the Capuchin at BCI. Uttered in series comme ça: -----

----- etc.

This does not seem to be accompanied by any definite ritualized postures or movements.

I think that it must be some sort of "Contact Call" (I shall call it "CC" for the time being). I don't think it can have a very strong hostile component. They seem to stop it when they are alarmed. They also stopped it when they forgot our food very briefly. They tend to do most of it, I think, when they are fairly far apart in the cage.

It is possible that they tend to do CC a lot when human beings come near the cage. They are very tame, and this CC toward people may be an attempt to "call them in".

If the CC is hostile at all, it must be very mildly so, with a \pm probably nearly balanced.

These animals also seem to use all their fingers radially to clasp branches — seldom or never opposing the thumb to the other 4 fingers. (And they have small branches to clasp, unlike the Haban

Cacajou rubicundus, Oct. 24, 1958, II (3)

in Warlington.) They also use all their fingers together when holding things up to their mouth to gnaw on.

They have spent some time grooming one another.

One of the animals pulsed its lips, at its keeper, for a few seconds, without uttering a sound, in between 2 little series of cc.

They both wag their abbreviated tails repeatedly from side to side, for a few seconds, from time to time. Usually when not uttering sounds. God knows what it means.

Both animals are remarkably agile and active and both are constantly gnawing on things.

There have been a number of real or "mock" fights between the 2 animals within the last 5 minutes or so. All quite silent, without any ritualized postures or movements.

They have also almost stopped giving cc for the last 15 minutes or so. Getting used to me?

Cacajou rubicundus, I October 25, 1958
Brown Zoo

Watching the Nalacaris for a brief period this morning. They are inside, because it is raining. Even more active than yesterday. Feeding, fighting, and displaying to me.

Doing lots of cc like yesterday. Low to moderate intensity cc seems to be done with the mouth closed, but it opens & closes during high intensity, i.e. particularly long & loud, bursts of cc. In rhythm with the notes.

The lips may be puckered when the animal is silent or when it is giving any kind of CC, with or without mouth open.

There seem to be at least 2 other sounds related to CC. Single notes, or notes repeated in series like the notes of a CC series.

The animals may utter bark-like sounds instead of the usual pleasant squeaky CC Notes. Sound quite remarkably like the B Notes of the Black Spiders at BCI — particularly like those of the new young S Spider. And some of them have a quaver or trace of trill, just like the "Farting" Barks of S!! I shall call these BCC. Both the Habanos have done them from time to time. In the midst of or in between series of ordinary CC, always apparently provoked by and directed toward me. I think these BCC must be aggressive. They sound like it. Also one animal bit vigorously on the bars of its cage while it was giving a series of BCC Notes. One animal also started BCC just after running forward from the back of the cage and leaping at the front bars where I was standing!

The other new notes sound just like particularly long, high pitched and shrill, very squeaky ordinary CC's. I shall call them CC. Also given in the midst of ordinary CC series I haven't been able to determine anything about their causation or function, but they certainly don't seem to be more aggressive than the ordinary CC's. Perhaps just higher intensity.

These two monkeys have both done a lot of "tail-wagging" today. I shall call this Wgg. In a wide variety of circumstances. One animal did a lot of Wgg while it was doing BCC at me. One animal also did a lot of Wgg while it was sitting quite about

Caecyon rubicundus, Oct. 25, 1958, III. (5)

and tense, apparently alarmed, watching a dog which had come into the building. They have also Wgg'd when just sitting and giving ordinary CC's, rather low intensity, apparently at nothing in particular. There does seem to be a tendency for Wgg in general to occur before the animal moves off. It may be nothing more than a ritualized signal indicating a desire to move.

Both the BCC and CCC intergrade completely with the ordinary CC. Morphological intermediates of all kind are very common.

Both the BCC and CCC may be accompanied by pronounced drawing back of the lips and baring of the teeth.

If the ordinary CC is homologous with the Squ of Cebus and Ateles, as I think it is, then the BCC may be strictly homologous with the B of the other species, and the whole hostile repertoire may be roughly similar to that of the other Cebids (s.s.).

I have now seen & heard several more single BCC Notes in the midst of CC series, and almost all these single BCC's were done with puckered lips. Made the animal look particularly like the S Spider Monkey at BCI.

The 2 animals have fought quite a bit this morning. Usually over food. Some of these disputes seemed to be quite "serious". With prolonged wrestling and (at least) vigorous biting in moves. The brief and apparently low intensity wrestling matches were quite silent, but the longer matches with more biting moves, were accompanied by a variety of sounds, some obviously ritualized and some apparently not.

There were a lot of grunts during these bouts. Probably not ritualized. Quite variable. Sounded like the grunts a human being

might give during a fight or wrestling match.

Much more interesting were 2 other calls.

One was a lot of hoarse ribulant humming "Hrrrrrrrrrr
Hrrrrrrrrrr" Lots of long (but rather irregular)
notes. Not definitely arranged into anything like an organized call
I shall call this "Hrs." Most peculiar.

The other vocal pattern consisted of sharp "Tsk" Notes.
Usually uttered in rapid series. — — — — —

The Hrs was relatively common during the moderate to high
intensity fights, but the Tsk Notes were rare. The Tsk Notes may
have been confined to the very highest intensity moments of the struggles.
Both patterns are probably very aggressive, and the Tsk may be hi-
gher intensity than the Hrs.

• Intergrades & morphologically intermediate notes between
the Hrs and series of Tsk Notes were not uncommon during some
disputes. Sounded rather like Hrs's with a "staccato rattle" und-
ertone of varying strength.

I watched the animals cleaning their faces after feeding sev-
eral times this morning. Usually (i.e. 2 or 3 times) by rubbing the
muzzle against the bars of the cage, but once one animal seemed to
clean its face by brushing its hand across its mouth & chin.

I am now fairly certain that the ccc is just high intensity cc.
The middle notes of a series of ordinary cc's are usually somewhat
higher in pitch than the others. Course ca: — — — — —
I have now heard this "rise" in the middle of the series go so far
that the middle notes became real ccc.

Cacajou rubicundus, Oct. 25, 1958, II (7)

Both monkeys did a lot of cc when I first appeared today, and then gradually gave less & less as I remained sitting quietly. Just like yesterday. But they tended to resume vigorous cc-ing for a few moments each time I moved around. I think this may really indicate that the cc is really a mildly hostile pattern.

Cacajou rubicundus I October 26, 1958

Broux Zoo

Back again today for a little while.

The Keeper tells me that this pair are mother and son. The ♂ was young when the animals came, and it is possible that he is still just slightly sub-adult.

I noticed today that the 2 animals are behaving rather differently (probably both are reacting to me in different ways).

The ♀ spends most of her time just clinging to the front of the cage, uttering cc, and Wgg-ing almost constantly. (According to the keeper, the Wgg is a sign of friendliness like the tail-wagging of a dog). She certainly doesn't seem to be either greatly frightened or very aggressive toward me. (When the keeper let her out of her cage at feeding time, she immediately climbed up on my head).

The ♂ has come to the front of the cage less frequently than the ♀. When he does come up, he usually tries to jump on the back of the ♀ and cling there. According to the keeper, this is a sign that he is slightly alarmed — which certainly seems quite plausible.

It may be significant, therefore, that the ♂ has uttered

Cacajou rubicundus, Oct. 26, 1958, II. (8)

little or no CC, and usually utters a lot of CCC (with lips drawn back and teeth bared) when he does come to the front of cage. (He sometimes utters this when he is clinging to the back of the ♀; but it is much more common when the ♀ doesn't let him climb up, or throw him off, or the relatively few times when he doesn't try to climb up.) I have also noted that although most CCC Notes are longer than typical CC Notes, some CCC Notes, apparently the very lowest intensity, can be as short as CC Notes. These facts would suggest that the difference between CC and CCC is something more than just general intensity. It is beginning to seem probable that the CCC contains a stronger escape component than the CC.

It may also be significant that the young ♂ hasn't done any Wag. Sits & walks with tail curled up between legs.

When the ♂ does climb onto the ♀'s back, she always tries to throw him off. This may lead to a brief struggle, but the ♂ usually gets or is thrown off very quickly. I have seen about 7 or 8 of these brief struggles this morning, and none of them have been accompanied by any of the sounds I heard during the disputes over food yesterday. Some have been quite silent.

The only sounds I have heard associated with these struggles are CCC by the ♂, which sometimes occurred before he climbed up or as the ♀ tried to throw him off, but which were probably provoked by, and really directed toward me (see above) — and a sound which can only be called "R" !!

This R really occurred whenever the ♂ came from the back of the cage to join the ♀ at the front, whether he tried to climb up on her or not, and whether she immediately threw him off or not.

Sounds quite mechanical, like the R's of many birds, but is very very soft — almost inaudible at a distance greater than 4 or 5 ft. I think that all these R's were given by the young ♂, but I'm certainly not sure about this. I rather doubt if it is hostile (The young ♂ occasionally uttered R's when sitting pressed tightly against the ♀, when there were no overt indications of hostility between the two animals.)

I may have to modify the above statement a little. There has been another burst of R now as the ♂ tried to climb onto the ♀, and this led to quite a vigorous struggle. Both animals bared their teeth (BT), and the ♀ actually made biting intention mous — I think. Anyhow, the R's continued throughout the struggle.

The R is certainly uttered with the mouth absolutely closed.

It seems obvious now that this species has a larger & more varied vocal repertory than any of the Cebini - Atelini.

This makes it all the more remarkable that it doesn't have an Alarm Call. (I forgot to add, yesterday, that the large dog came back and stood in front of the Uchhari's cage for several minutes, whereupon the monkeys put out quite silently and peered at the dog.)

I have been in front of the Uchhari cage for about 45 min. now, and the behavior of the two animals has changed, presumably as they are getting used to me. The ♀ is giving fewer CC. And the ♂ has almost stopped CCC, and is only giving a few CC from time to time. Very nice!

There has just been a small fight between the 2 animals.

Cacajon rubicundus, Oct. 26, 1958, IV. (10)

couldn't see what started it off, but it was certainly accompanied by a lot of Hss by one or both animals. Definitely with BT.

Perhaps the BCC contains a strong escape component also - at least sometimes in some circumstances!! Several times the monkeys have given a single very sharp BCC Note when there has been a sudden loud sound (like a pail falling over) in the neighborhood. And the keeper says that they do BCC toward a hangar of which they are afraid. Still, I find it hard to believe that it contains as relatively strong an escape component as the CCC.

This species certainly looks like one of the most intelligent monkeys. Constantly reacting to the observer - like the Capuchins.

Cacajon rubicundus, I October 30, 1958
Bronx Zoo

Not too awfully much new today. The two monkeys behaving much as before.

It is definitely the ♂ who does the R when he runs up to join the ♀ at the front of the cage. This would be easier to interpret if it weren't for the fact that the ♀ is always peering intently at me when she is at the front of the cage, and the ♂ tends to do so also when he joins her. Some of these R's must be directed toward the ♀, but at least 2 today seemed to be definitely provoked by and directed toward me. Given by the ♂ when he was 6" to 1' away from the ♀, looking directly at me. One of these R's toward me was definitely accompanied by BT! This would suggest that the R is hostile.

There have been quite a lot of disputes between the two animals this morning. Again much as usual. Some of them certainly quite silent. Others accompanied by Mrs's. No trace of R at any time. Why??

They were given some pieces of sugar to eat, and the ♀ seemed to be somewhat baffled by what to do with the lump. She rubbed it on top of her head, and along her arms, in a quite clumsy-looking manner. And at least twice she uttered Mrs's during this manipulation. Doubtless the ♂ was far away. Apparently provoked by and directed toward the lump of sugar (she was fixating the lump each time she uttered the Mrs's). General frustration, leading to anger, leading to Mrs's???

I have been watching the way they use their hands in a variety of circumstances. The thumbs don't seem to be opposed at all in ordinary situations. Fingers all appressed together, or spread more or less radially when moving along branches. (Once or twice I have seen a trace of the 2-3 division like the Howlers). Food & such objects are grasped in the hand with all the fingers joined together. (But they do seem to be quite expert at manipulating things this way.)

The big toes, of course, are perfectly opposable, and are opposed almost all the time when the animals move along branches.

There is one peculiar pattern which these animals do a lot,

Cacajou rubicundus, Oct. 30, 1958, # (12)

but which I have not mentioned before (here). This is sticking the tongue out. They do it a lot when they are hanging on the bars of the cage, looking at me. Often combined with latching on the bars. This may be nothing more than just "tasting" or "testing out" the bars, but it might also be a best description of some sort.

I think that "puckering" of the lips (PL), as distinguished from BT, only occurs with (or is only characteristic of) BCC.

Cacajou rubicundus I October 31, 1958
Bronx Zoo

Watching the animals as usual. Today, the ♂ greeted me by standing in the middle of the cage, quite far away from the ♀, and doing definite R with pronounced BT. I presume that the R must be low intensity hostility - with perhaps some slight "friendly" or "fawning" component.

Several times, during the last few days, the ♂ has shown a trace of the jumping up-and-down, or pulling or shaking the bars of his cage, behavior which most other monkeys show when they are "angry." I presume he was angry too. Interestingly enough, all these performances were quite silent. In other words, the animal is silent when the attack drive is strongly predominant over counteracting motivation - at this intensity level at least.

Cacajou rubicundus, I November 1, 1958

Bronx Zoo

I have noticed that both Nabaris tend to give bursts of high intensity, sounding cc, ccc, and Bcc, whenever I or some one else either approaches their cage (for the first time, after an absence) or starts to leave.

Some of the notes apparently associated with Bcc, presumably variants, have an even more "tull-like" quality than the "forting" barks of the Spider Monkeys or the "quavering" notes mentioned above, (Oct. 25, p. 4), sounded just like some of the soft tulls of the S Spider at BCI.

Cacajou rubicundus, I November 7, 1958

Washington Zoo

The single Red Nabari here has some most peculiar behavior which I noticed before and have seen again today. It will rush about its cage (this often looks aggressive, with some BT at times, and possibly some vocalization — although I can't be sure about the latter, as the cage is glass-fronted), and then rushes back to its box and starts to bite itself (!), particularly its knees, often rolling about on its back in a quite excited manner. This might conceivably be some peculiar form of grooming behavior — or even redirected attack (these bursts of activity might be provoked by my presence).

Cacajou rubicundus, Nov. 7, 1958, II (14)

But Gummer also tells me that this animal was very sick when it first arrived (some affliction of the nervous system) so the whole reaction may just be quite abnormal.

This Mahari does not seem to wag its tail at all. I don't think that it is a particularly tame or domesticated individual. This, in conjunction with the fact that the somewhat shy young ♂ at the Bronx Zoo doesn't do much (or any?) wagging either, would seem to confirm the theory that wagging is an indication of "friendliness" — whatever that might mean.

This individual here will sometimes come to the front of its cage and lean both hands against the glass. It is then noticeable that the fingers are "divided" 2-3, like those of the howler monkeys.

Cacajou rubicundus, I September 1, 1959
Bronx Zoo

The same two Red Maharis are here as last year. Just as tame, active, and curious as before.

Behaving much the same as last year. cc, ccc, Wagg, etc. I have only noticed a couple of new behavior patterns and/or seen a little more of some of the patterns. I noticed last year.

Again, I have been struck by how much the cc-ccc complex seems to be a general frustration and/or gregarious reaction. The animal

als always give a lot of cc-ccc when I approach their cage, of course; but today I noted that they also give a sudden burst of cc, and especially ccc, when I move away — and continue both types of notes after I have passed out of their sight! This would certainly suggest frustrated gregariousness.

Actually, when the ccc notes are particularly loud and frequently repeated, the whole performance is quite reminiscent of the O of Callithrix. This could also be called a "ringing" monkey!!!

Quite frequently, when I first approach the cage after being away for some seconds, the ♂ begins R — just like last year. Approximately 2/3 of the R he has given today has not been accompanied by an ritualized posture or movement, but the remaining third has been accompanied by definite BT (without MD, i.e. without opening of the mouth, in most cases). This would definitely seem to indicate that the R is mildly hostile.

I am still surprised to note that the ♀ doesn't seem to give any R at all! This morning, in the same circumstances, apparently "instead" of R, the ♀ has done "chomping" movements, rapid opening & closing of the mouth. Quite emphatic. Quite reminiscent of the "chewing" of the Titis and Howlers. I shall call it "chomp" for the time being. I think it must be hostile. The ♀ is certainly quite tame and "friendly" toward me, but I notice that she definitely chomps when I first approach the cage after a brief absence, and not when I hold out food, or something which might look like food, to her. So it is apparently definitely not a feeding reaction.

The keeper tells me that when these animals are pushed up against their wall they utter very shrill high-pitched screams!!!

There has been a lot of wrestling going on in the cage today. Between the two Red Naharis, and between the ♂ Red and the young White Nahari in the same cage (see today's notes on calves). This all seems to have been "mock" wrestling, i.e. the result of "inhibited" hostility. The sounds uttered by the Reds during these encounters included H's, CC, BCC, and (by the ♂) R. They also uttered some sounds which were more peculiar - possibly intermediate between screams & some of the other sounds. The ♂, for instance, uttered a lot of sounds which I think were probably exactly intermediate between "typical" silent H's and the scream. Sort of like typical H's with a faint "guttural" quality!!! I shall call these GH's. (Actually, I am not sure that the ♂ ever uttered any H's quite as silent or soft as his usual H's last year. Certainly, most of his "H's" today was really GH's!!! This may be a sign of increased maturity.) In any case, something about the GH's today made me think that the typical H's's, as I heard them last year, are "really screams without the screaming sound". Possibly what one would expect of an "inhibited" vocal pattern. The other interesting sounds uttered during the wrestling, between the Reds, were a series of short, harsh, notes which seemed to be intermediate between typical BCC notes and screams. Very reminiscent of the Brr Notes of Squirrel Monkeys in actual sound. Uttered in regular and obviously ritualized series. Usually or always with BT (and usually MO too, I think). I shall call these "GBCC".

Actually BT can be combined with quite a wide variety of patterns. Many BT's are quite silent. Others combined with CC, CCC, BCC, H's, GH's, GBCC, & R's.

Both animals gave another sound today which I had never heard before. Single very sharp & loud notes. Those of the ♀ usually sound like very sharp & loud brief CC Notes. Have a faintly squeaky or Q-like quality. Those of the ♂ are usually, or always, more like "arf". I think there may be AlB's, (at least I shall call them AlB's for the time being). It is usually difficult or impossible to determine what provokes them. At least twice, however, I thought they were provoked by distant sounds. A couple of times, also, they were given just before or just as the animals dashed away from me in apparent panic, but usually the animals just sat or stood, looking alert, when they uttered such sounds.

Several times today, the ♀ hung by her legs from a high bar, and swung repeatedly, with considerable force, against the door where I was standing. Usually accompanied by CC Notes. All this was very reminiscent of the Judo of White-faced Capuchins (and the equivalent pattern of Spider Monkeys, during which they frequently swing by the tail or by the tail and a leg.)

Again, today, I was impressed by the frequency with which these animals groomed each other — and tried to groom my hand & fingers when I let them. All very reminiscent of Cebus.

The general impression these monkeys give is really quite like Cebus in general. This impression must be due to their comparatively great activity, nearly constant vocalizations, and responsiveness and attentiveness to a human observer.

I think there is no doubt now but that the "CC Complex" of these animals is strictly homologous (and analogous) to the "B Complex" of many other Platyrrhines. It may also be homologous

||| analogous with the "sqn complex" of other species.

Cacajon rubicundus, I.

September 2, 1959

Brown Zoo

Got some interesting reactions today by separating the two Red Uakaris. In two separate cages, where the animals could hear one another, but not see one another. The ♀ Red was in a big cage by herself; the ♂ Red was left in a small cage with the Little White.

All 3 animals began to call as soon as they were separated. The ♀ did lots of cc and ccc. I am now certain that the difference between cc and ccc is purely one of intensity — and the difference is so slight, and so completely bridged by intermediate notes, that it is hardly worthwhile maintaining the separate terminology. When the ♀ got really worked up, she uttered long series of notes, beginning with ordinary cc and gradually becoming louder and louder, almost howling, "Uuh Uuh Uuh..."

The last notes of this series were quite different from the notes I have been calling ccc, insofar as they were very short and relatively low pitched (not long & shrill). The whole performance was very reminiscent of the O performances of Fitis (and see today's notes on Callicebus). The last notes of the series were apparently absolutely identical with typical O notes of Fitis, except that they were probably slightly louder. I shall call this performance "O" too, as I am sure that it is strictly homologous and analogous with the O's of Fitis. Provoked by frustrated gregariousness.

and/or frustrated parental motivation.

(The keeper says that one or both animals will sometimes utter "3 or 5 note" series of the more honking O Notes when separated. Apparently without gradual "build-up" from cc. I don't know how reliable he is about such details, however.)

The ♀ also did a lot of Wgg during the separation.

To my surprise, she also uttered quite a lot of single "al B" Notes from time to time in the midst of her other vocalizations while separated! This might suggest that the "al B" is not hostile in this species, but I suppose there may be other explanations of its appearance in such circumstances.

The ♂ behaved slightly differently from the ♀. He also uttered a lot of cc and "ccc" Notes, but he only gave one or two indications of a long cc-O vocalization like that of the ♀ (when he did utter a long series of notes, the terminal notes were never very "honking" in quality).

What he did do was utter occasional short, irregular series of notes, the individual notes of which were quite like typical "ccc" - but even longer & shaller and somewhat plaintive in tonal quality. These were presumably just the extreme development of "ccc"-type notes. (They were just slightly reminiscent of the W Notes of Tamaricus in quality.)

The ♂ also uttered a lot of "al B" Notes.

There is no doubt but that "al B" Notes were uttered much more frequently by both animals during the short period they were separated than at any other time this morning. This increased frequency might conceivably be correlated with the fact that they were

obviously upset & probably unusually active during the period they were separated.)

I noticed that the ♂ did far more Wgg-ing than usual (he usually does little or no Wgg-ing) during the period when the animals were separated - even when he wasn't being very unusually active. This would seem to be a strong indication that the Wgg-ing is produced by strong frustration of gregarious motivation. (The reason why the ♀ has always done so much Wgg-ing is probably that she feels more social toward the human beings outside her cage.)

The ♂ also did another pattern which I have never seen before during the period of separation. Three times he suddenly went into a fit of scratching or pawing at the floor or side of his cage!!! And once he scratched frantically at his side or flank! This is presumably strictly homologous with the fit of other species, but it is interesting that it is so rare in this species, and that the performing animal does not usually scratch its own body!

In this connection, I might add that I don't think I have ever seen either one of these animals ever scratch itself in any other circumstances!

I noticed one peculiar feature of the hands of these animals today. They have a very prominent callus near the base of the metacarpal of the thumb. All the fingers tend to press against this callus when an animal tries to grasp something. In other words, the callus acts almost like an opposable pre-hallux.

Cacajou rubicundus, I August 4, 1964
Barro Colorado

We have had a single Red Howler in captivity for at least six months now. Probably ♀. Perhaps half grown when we first got it. Perhaps almost full grown now. Kept in large cage inside animal house. With "Colombia", the Cebus (?) nigritus.

Apparently in fine health. Very active. But has shown very little in the way of display. At first rather shy, but has been tame for months now. Loves to play with human beings. These facts would suggest that the species displays frequently only during intra-specific reactions.

This individual is called "Underraga" ("U").

It has not performed much in the way of real brachiation i.e. swinging along hand over hand. Quite possibly because there is not enough room in its cage. But it does swing back and forth, both hands clutching a branch, during play. May even swing up and completely over a branch.

Frequently plays with Colombia as well as with human beings. Almost all this play quite silent. Only very occasionally does it utter a single A or when play is most active and rough (and, presumably, no longer "in fun")

But all, or almost all, its play, from the very beginning has been accompanied by one or more silent ritualized patterns involving the mouth. Mouth always or almost always at least slightly open. This does, I think, always or almost always reveal the teeth. Primarily the front lower teeth. (Reminiscent of the BT of

Sites. And it is probable that all or most of the patterns that I called "BT" in my earlier accounts of Red Howlers were identical with this pattern of Undurraga. I shall continue to call it (BT.) This is not usually accompanied by conspicuous drawing back of the corners of the mouth (the sort of pattern that other ethologists call "Grin"). But, it is possible (although I am not sure) that the simple BT becomes transformed into a Grin, occasionally, when play is particularly vigorous.

During the last couple of weeks, V has begun to perform some additional patterns during play with Colombia (not during play with human beings). Every once in a while, when play becomes particularly rough, it will utter a long series of short notes in fairly rapid succession. Each note sounds quite like a Chk of the Sites (and I think I will call it by the same name, at least temporarily), but with a slight grunting quality. Obviously hostile. I think that these notes tend to be uttered when V obviously "loses its temper" and becomes aggressive. They may be the same thing that I called "BCC" earlier. (Also possibly related to what I called "Jck" earlier. Or intermediate between BCC and Jck.)

Today, after one burst of Chk Notes, V sat in a corner of the cage looking at Colombia and performing definite Tail-wagging. First time I have seen it perform this Wgg. The animal was quite silent during the Wgg, but did have its mouth open (probably in real BT). This Wgg certainly did not look friendly. Apparently hostile. Probably lower intensity than the immediately preceding Chk Notes. Looked rather aggressive.

V has certainly performed Allogrooming with Colombia,

Cacajou rubicundus, Aug. 4, 1964, III. (23)

but I haven't watched this in any detail.

When I first arrived, we used to take it for walks in grass and low scrub. It was incredibly good at seeing and catching insects!!!

Cacajou rubicundus, I August 9, 1964
Barro Colorado

Today, just after wrestling with me, Undurraga uttered 3 CC Notes in rapid succession. Not accompanied by any overt signs of active hostility. It was obvious that these CC Notes are strictly homologous with the W-type Notes of Pithecia monachus!

Cacajou rubicundus November 14, 1965
Barro Colorado

For some months now, we have had 4 individuals of this species. Undurraga ("U"), who is apparently fully adult now. Plus three half grown juveniles. (One of these juvs is particularly tame. I shall call it "A".) All four are in beautiful condition. According to Bora, all four also are female. But I am not sure that he is right about this.

Today I spent considerable time observing and recording the animals, in a 30 ft outside cage, just behind the laboratory. They were quite calm throughout. As a result, they did not perform anything very spectacular. But I did

at least note the following:

They usually move like Cebus I.E. running on all fours. But they also swing under branches occasionally, using their arms alone, in pure brachiation. Also occasionally stand up on their hind legs. So my interpretation of their locomotion probably is correct.

When they are running on all fours, they use their hands in much the same way as howlers or sakis. But, possibly, the "division" of the fingers is less extreme, on the average. The thumb usually is on one side of the branch. The outermost three fingers usually are on the other side of the branch. But the "index" finger often is flexed, and kept in a "central" position, intermediate between the thumb and the outer three fingers. I.E. division might be summarized as 1-1-3. Thus the hands of these Uakaris may be less chameleon-like than those of howlers and sakis. Possibly intermediate between those of the latter and Cebus.

The initial approach or "investigation" of strange objects (e.g. a microphone) is characteristic. Using several sensory modalities. One hand usually is stretched out toward the object. At the same time, the head is brought forward. Apparently in an attempt to smell or sniff. At the same time, the tongue frequently or usually is protruded to some (rather slight) extent. Apparently an intention movement of tasting. (Possibly these intention movements of smelling and tasting are performed because the animals are used to receiving food from human beings??)

The animals performed a variety of obviously low intensity signal patterns today. Including:



I. Olfactory signals? Several times I saw individuals (both I and at least one juv.) rubbing the chest, or the side of the neck and/or cheek, against or along a branch or twig. Sometimes while sitting erect. Sometimes while lying down. But such patterns were rare. Possibly not ritualized. (Perhaps nothing more than "scratching" or "itch".) Certainly, neither the performers nor the other animals made an attempt to sniff at the rubbed branches. And I could not see any obviously glandular areas on the chests, necks, or cheeks of the performing individuals.

II. Tactile signals. Allogrooming seems to be the only display in this category. It was moderately common today. Sometimes I groomed one or more of the juvs. Sometimes one juv. groomed another. But I was never groomed by any juv. I.E. the groomer probably always is dominant.

All the Allogrooming observed today was brief. All of it was done with the fingers alone. (In this respect, Allogrooming seems to differ from autogrooming. During autogrooming, the teeth are used as well as the hands.)

The juvs. occasionally "invited" Allogrooming. The "invitation" was simple. It consisted of nothing more than "presenting" the back. (I.E. facing away from the potential groomer.)

III. Visual signals. There is a variety of signals of this type:

A. V always keeps its tail up. Comme ça:  or even  while moving around. Sometimes the juvenals keep their tails in the same position. At other times, they keep the tail curled down, and forward, between buttocks and legs. This depression probably is an indication of anxiety. It is characteristic of juvenals when they obviously are slightly alarmed. (NOTE: V never was alarmed during my observations today.)

None of the animals did any Wag today!!!

B. V performed several bouts of Jud today. Obviously provoked by and directed toward me. Bouncing up and down on top of a branch — without ever letting go with either hands or feet. Once I thought that Jud was accompanied by erection of the long hairs of the back.

• Some of V's Jud was followed, immediately, by rapid "swinging" around, or under, a branch. Usually, I think, V kept hold of the branch with both hands and feet during the "swinging". This "swinging" may be an "intention" movement of "frenzy".

None of the juvenals ever performed Jud or related patterns.

All of the Jud and related patterns by V were silent.

C. All the individuals tended to bite at twigs or branches when I approached them. I think that some, at least, of this biting was redirected hostility.

D. All the other visual signals observed were "facial" expressions.

(i) MO. The jaws certainly, and I probably frequently opened their mouths, more or less widely, without pulling back the corners of the mouth. In which case, the teeth were not revealed very conspicuously. This pattern obviously is very low intensity. And its significance is ambiguous.

(ii) BT. This is a very common pattern. Probably little or nothing more than a low-intensity Grin (see below). The lips are separated. Sometimes the jaws are separated slightly but visibly. Sometimes the mouth appears to remain essentially closed. In any case, the teeth are conspicuous. The "corners of the mouth", i.e. the lips, are drawn back to some slight extent. This pattern (also) is fairly low intensity. Obviously at least partly hostile.

(iii) Grin. A typical monkey grin. Mouths opened moderately widely. Corners of the mouth area drawn back to extreme extent. Teeth very, very conspicuous (upper and lower teeth very well separated). This was seen only once. By a juv. looking at me. Silent. Presumably fairly high intensity. Presumably containing appreciable hostility.

(iv). PL? I think that several of the juvs occasionally protruded their lips without opening their mouths. But the pattern was not very extreme. And apparently relatively rare.

(v). Tongue-out ("TO"). A frequently protruded

ded its tongue (center of mouth) when I approached it. Obviously a low intensity reaction. Possibly partly friendly. Greeting? (Also possibly an intention movement of tasting, in expectation of being given food.)

(vi) A also occasionally half closed eyes when I approached. Fear? Or reaction to smoke from my pipe?

(vii) Probably all the animals moved their eyebrows occasionally. But these movements never were conspicuous. I did not pay attention to them. Difficult to study.

NOTE: All the "facial expressions" were usually silent. But sometimes the BT was combined with Purring (see below).

I don't know if the CC Notes (see below) were combined with particular facial expression(s) or not.

NOTE: I saw no trace of any LD or Hold pattern, or "displacement" set, or anything like a ritualized Arch. The latter would not be expected in the circumstances of today's observations, but the apparent absence of the other patterns may be significant.

IV Auditory signals. The animals uttered a few types of sounds and performed some other patterns which were (at least faintly) audible:

(i) C Notes. These were the most common vocal signals, but they were uttered only at moderately frequent (irregular) intervals. Single notes and short series. Obviously only moderate intensity. No trace of anything like Ecc or Bcc.

It was obvious, today, that CC Notes are at

least partly (and at least occasionally) hostile. Containing an appreciable escape component. There usually was a burst of CC Notes whenever a human being appeared near the cage unexpectedly and when there were other, minor "panics" (rapid retreat movements) among the animals (apparently released by stimuli outside the cage which I did not perceive, or recognize).

The CC Notes of this species apparently are homologous with the Squ - QDC - TW patterns of other species.

Some or all CC Notes also may contain friendly components. And/or remain partly "distress" calls.

(ii) Hrs. I heard this once today. When 2 juvs were engaged in "play" wrestling.

(iii) Gurg. Once, A uttered a single murg while near me. This appeared to be unritualized.

(iv) Purr. A uttered Purr's frequently when close to me. Typically laboid in sound. Very soft. Sometimes uttered with mouth completely closed. Sometimes with slight BT (see above). In any case, sound obviously is coming out through the nose. Purring obviously is largely friendly. But it also obviously is partly the result of frustration and/or hostility. It was particularly likely to be uttered when I moved my hand, or the microphone particularly close to A.

(v). Several of the juvs did a lot of "chewing" when I approached them. Quite like Chewing of Tit's.

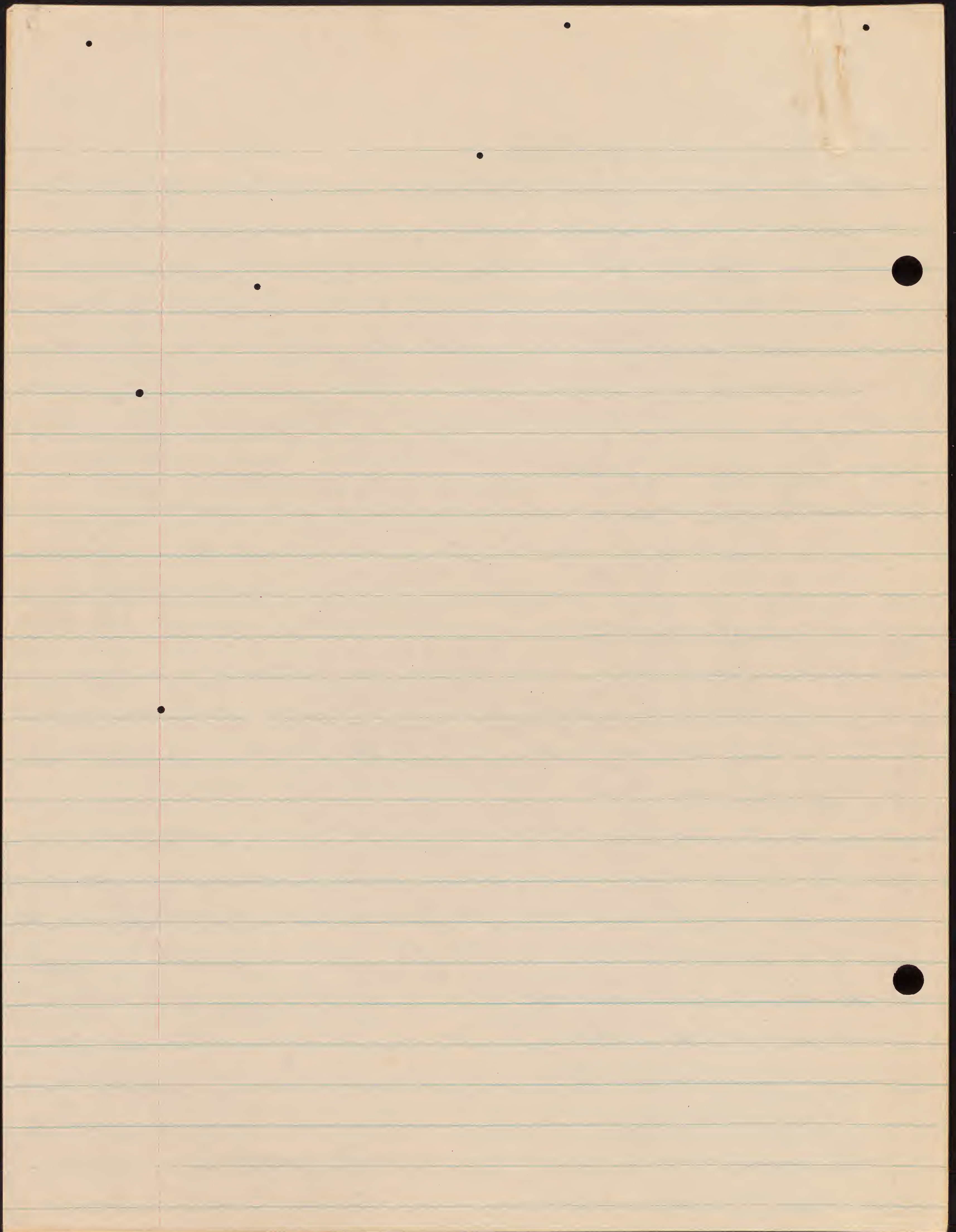
in form. Sometimes quite audible. Frequently closely associated with Purring. Probably a sign of "nervousness". Possibly an intention movement of redirection biting.

(vi). "Hiccups" At one time this morning, A made a lot of single hiccupping noises when I was close to it. Associated with Purrs, Chewing, and redirection biting. But it did not utter these hiccups in similar circumstances later in the day. So probably they were not ritualized.

GENERAL COMMENT. These Hakaris seem to have a lot of different types of (actual or potential) signal patterns. But they don't on the whole, seem to use the obviously ritualized patterns very frequently. This would suggest that a lot of their social interactions are mediated by unritualized movements and intention movements. This, in turn, would suggest that they live in very coherent groups in the wild, all the individuals of a group sticking close together. And/or that they are particularly vulnerable to predation. They certainly are much less "noisy" than Sabris. Have relatively more non-vocal signals than the Sabris, and relatively more of their auditory signals are "quiet". I presume that they are either more vulnerable than Sabris and/or live in more tightly integrated groups. This is a point that must be checked by observation in the wild!!!!

CACATOU CALVUS

I



Cacajou calves, I

September 1, 1959
Bronx Zoo

There is one half grown (or slightly less) White Nohari here in the same cage as the two Reds. May have a slight, very slight, case of rickets in the hind legs, but otherwise is fairly active and seems to be fairly healthy.

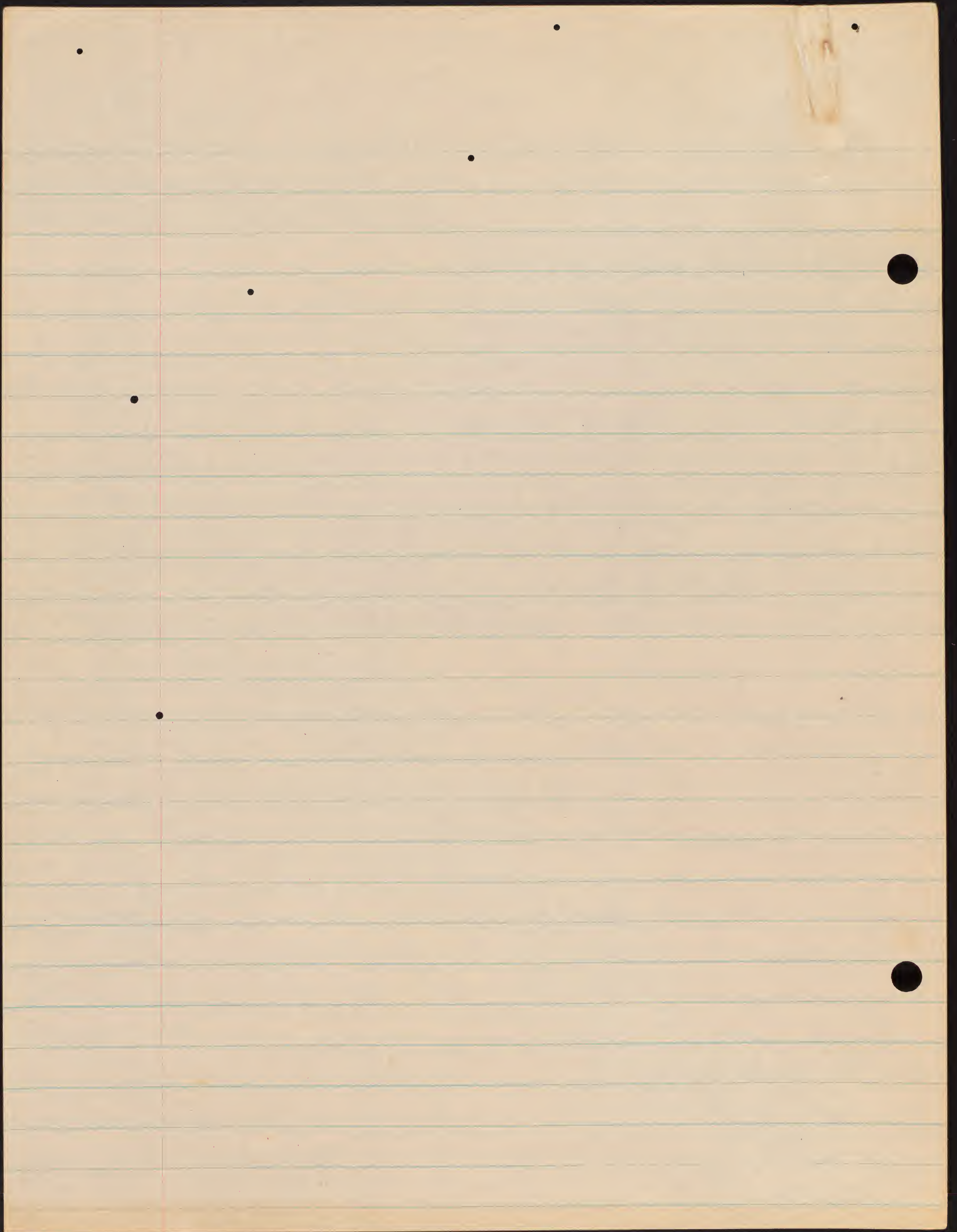
It is much less tame than the two Reds. Comes up to the door of the cage when I sit there, but always retreats if I stick my hand out. It may be significant, therefore, that this little White Nohari is usually silent!!! I only heard it utter a very few sounds during two hours observation today.

Once it gave a burst of CC (and CCC?) Notes when the Reds were being particularly vocal.

I think it also uttered some very "silent" Hrs, with BT & MO, when it was wrestling with the ♂ Red (see today's notes on rubicundus). Just like the ♂ Red sometimes uttered last year.

This little White also did a lot of silent BT, both with and without MO, toward me.

Every once in a while, after it had done BT & MO toward me, (perhaps when I moved ???) it would suddenly seem to "go crazy." Suddenly doing lots of Jwd, wheeling round & round, crawling on its stomach, etc. All this usually with BT and MO too. I think this was probably a definitely "ritualized" complex of some sort. It reminded me very much of the behavior of the Red Nohari in Washington described on Nov. 7, 1958, p. 13 (although this White apparently never tried to bite itself). I think I shall call this pattern the "Frenzy."



①

CACAJOU RUBICUNDUS July 12, 1961.

Tail-wagging. Indication of "friendlyness"? Frustrated gregariousness? Performed much more frequently by old, tame, ♀ than by young, shyer, ♂.

BT. With CC, CCC, BCC, Hss, GBCC, & Trill's.

PL. (Only with BCC?)

MO (only with BT?)

Biting front of cage and sticking out tongue, like Cebus

Jud.

Chewing. "Chomping". Mildly hostile? Performed by tame ♀ when approached by ♂ or human being.

Trilling. Comparable to some "learned" reactions Cebus?

Drill. Mechanical rattle. "R". Soft. Uttered by young ♂ (alarmed) trying to climb on back old ♀. Also during wrestling. Partly hostile and partly infantile? E stronger than A? Often accompanied by BT.

CC Notes. "Contact" notes. Commonest notes of species. Sound rather like higher pitched, "whimpering", nervous MG Notes Cebus. Sometimes with pleasant squeaky quality. Very mildly hostile? General frustration and/or frustrated gregariousness? Presumably homologous

(2)

with Whistles Callicebus. Also Squ's and/or MGB's other species.

CCC Notes. Like CC Notes, but higher pitched and shriller. Produced by same motivation as CC, but higher intensity? More alarm than ordinary CC???? Frustrated yawns? Apparently related to Hoots.

Hoots. Long series of short notes, becoming gradually louder and more "howling" in quality. "Uuh uuh uuh..." Definitely homologous and analogous with Hoot-OB patterns other species.

BCC Aggressive sounding. Sometimes accompanied by (directed?) biting movements. Also attack (?) movements. Sometimes with BT. Usually (?) with P2.

Some BCC Notes "trilling".

BCC Notes may intergrade with screams. Intermediate notes (GBCC) sound like "Brr" Notes fairiviri

"CC complex" this species obviously largely homologous with "B complex" many other species.

Alarm Notes. Sharp "Arf"s. CC-type notes. Homologous with Q's Pniche's.

Hrs. During fights. Aggressive? With BT. May intergrade with screams (G-Hrs Notes).

y?

File Notes. During flights. Aggressive? Very high intensity

beings.

Screams? shrill high-pitched. When picked up by human

