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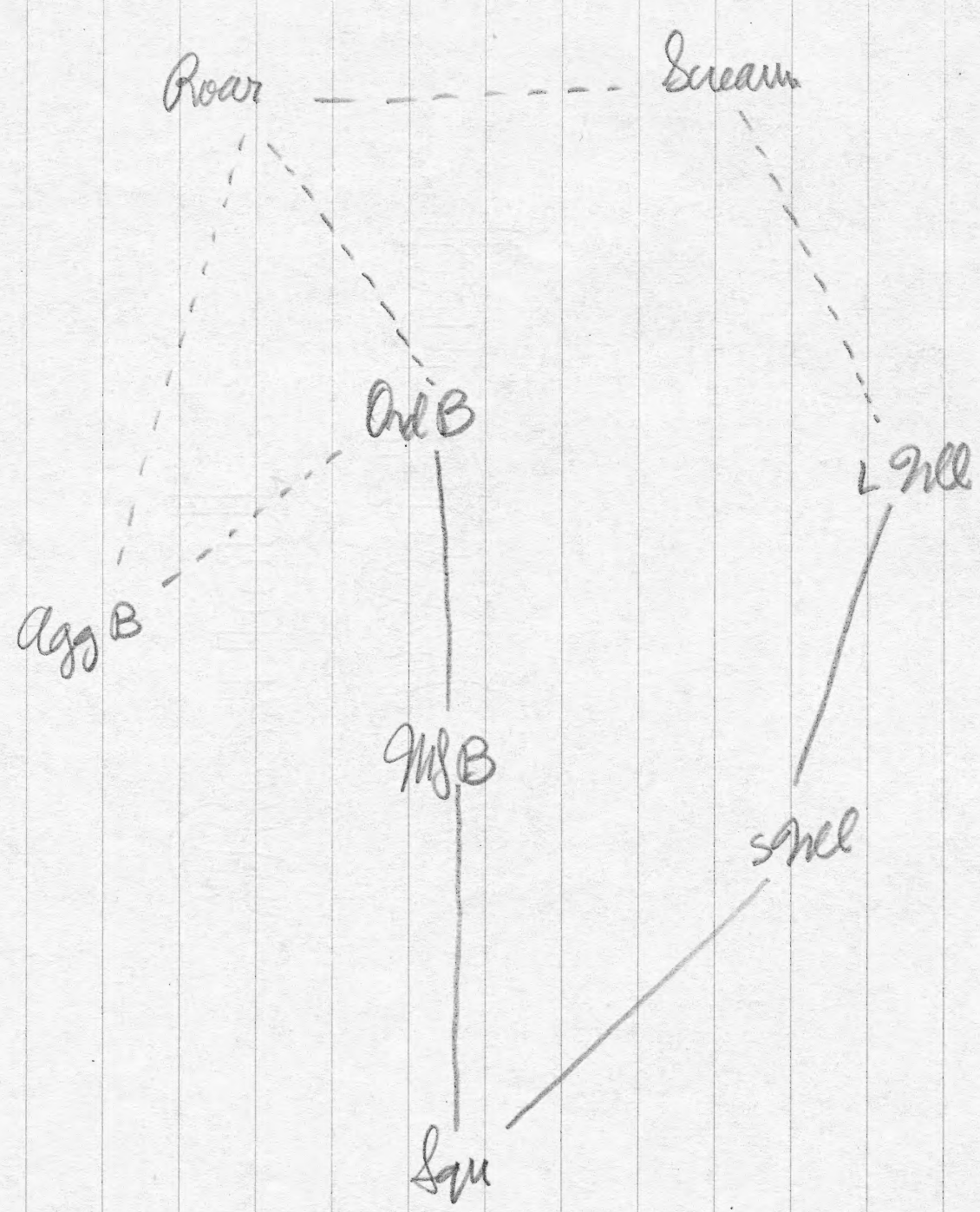

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ATELES sp.

I

Ateles fusciceps

//////// = Black Panama Spider Monkeys

October 2, 1958
Barro Colorado

I borrowed 2 young Spider Monkeys, apparently this species, from the Gorgas Institute, for a few days. Got them yesterday; put them in a big pen (with the capuchins) this morning. One is perhaps 1/3 grown. I think this is ♀. The other is much smaller, and I think is ♂. I shall call the small one S, the large one L.

Their behavior since I got them has been rather peculiar in a way, (or, at least, unexpected by me).

They have spent almost all their time "huddled". Apparently an alarm reaction. A single animal huddling by itself just sits on its haunches; with back humped; knees bent and pulled up tight against chest; arms clasped over knees, and wrapped around body; and tail also wrapped about body. Forming a tight little ovoid. The head is usually bent down too; continuing the line of the back. As the animal becomes a little less alarmed, it may raise its head and look around; but it puts its head down again immediately if a disturbing stimulus (i.e. usually me) approaches. In extreme cases, the eyes are also closed or half closed. A huddled animal is apparently always silent.

I shall call this Hdd

It may be related to the LD of the Pricke's. (And the eye-closing is probably the same as the eye-closing of the young Pricke's; H, which I am beginning now).

Actually I have seen relatively little Hdd by an isolated annual because the two are almost always Hdd-ing together when they clasp one another's tights (Cl) and wrap their arms around one another's tights. S usually tries, and succeeds, in getting its head under some part of L.

In general S has been much more prone to Hdd and Cl than L. This would suggest that the whole complex is essentially infantile.

Sometimes, if L starts to move away, S will continue Cl and be carried on L's back for a short period (L usually has to break away from S by "main force" anyway.)

I wonder how this Hdd-Cl complex is used in the wild when an infant has a mother present???

If L moves away from S, S usually follows it, very slowly, and usually utters high pitched squeals. Usually single, sometimes repeated, sometimes, perhaps, organized into little series of 2 or 3. Doesn't really seem to get any response.

In general, both animals seem to move remarkably slowly, particularly when alarmed. Absolutely the quintessence of cautiousness in appearance. (The only time I have seen either move with any speed at all is when L gets annoyed and starts Barking — see below).

If S is picked up in the hand, it usually utters one or more single, long drawn, shrill, uniform, rather whining shrieks. Obviously analogous, and probably homologous with the screams of Night Monkeys, and probably also the K of the Pericos.

This afternoon L seemed to get over his shyness, and then, whenever I approached, would start Barking. His performance quite as described by Carpenter. A more or less long series of Barking Notes. I shall call this performance B. Sounded quite like some of the barking notes uttered by Howler Monkeys before uttering the full long-drawn howling roar. Considerable variations. Some of the barks more plaintive than others. The plaintive ones sounded quite like some of the notes of Red-throated Geans!

The variations in the sound of the B Notes obviously correlated with different actual & relative strengths of the attack & escape drives.

Some quite aggressive. Deeper, harsher, & more guttural than the other B Notes. Call this Agg B. Often accompanied by little lunges towards me, also jumping up & down on branches above me, just like capuchins preparing to break off branches to drop.

The agg B performances were relatively rare. The attack & escape drives seemed to be nearly balanced in much of the B.

The Agg B Notes were apparently always monosyllabic, and so were some of the other, ordinary B Notes (Ord B), especially the low intensity notes at the start of a long series of B. But the obviously higher intensity B Notes tended to break up. (There were obviously high intensity because the animal ran around the cage in a relatively rapid and emotionally excited manner.) Essentially disyllabic. Slight

possibly be transcribed by something like "Ooh-uh". At the highest intensities, there seemed to be an additional quaver which developed (to give ——ɾ—— instead of ——·——); or, even, in some cases at last, a sort of "Ratchet" undertone under the last half of the bisyllabic note. I might mention, in this connection, that the preliminary grunts or barks of at least some Howling Monkeys before dawn are actually pure "Ratchet", without any real "throaty" roar or howl at all.)

I think that perhaps the most "Quan-like" Notes contained the relatively strongest escape component.

In general, I usually uttered its B Notes in very long series. Once uttered continuously for 25 minutes, with only one interruption, of no more than a minute. Another case in which a relatively small amount of motivation seems to produce an enormous effect — as I certainly wasn't wildly excited continuously all this time.

In such long series, I would vary the different types of B Notes, usually gradually, apparently according to circumstances.

Low-intensity B Notes were uttered with the mouth closed. Higher intensity Notes with the mouth open, and rather "pursed", jaws probably moving, at least a little, in rhythm with the notes.

The B must, as carpenter noticed, be homologous with the "barking roars" of Howler Monkeys. Possibly also homologous with MG's of Capuchins.

B was usually (always ?) accompanied by scattering (Sct). Flung one hand to scatter the other arm, or head, or back, or leg, or tail. Very conspicuous and regular. Not every note was accompanied by Sct, but when Sct did occur it was closely synchronized with B Notes, i.e. one note accompanied by one Sct movement, one note accompanied by one Sct, etc., etc., etc. In general, I think that L always began Sct whenever he wasn't running or swinging about the cage during B

Sct could apparently occur at all levels of B motivation. In one case, at least, it even started just before the B began, but it continued right up to the highest intensity B notes as well. Probably least frequent with deep B, if only because the animal tends to be jumping up and down then. Most peculiar obviously "displacement" — in the classical sense — whatever that may mean.

The frequency of Sct in hostile situations is the more remarkable in view of the fact that the animals don't seem to do much normal "autochthonous" scattering in other circumstances.

All the scattering of any kind performed by Saul L Sr saw today was with the arms & hands. None with legs & feet, or tail. But I did see one of the older Spider Monkeys at the Zoo gaze scratch its back once with the tip of the tail. Probably quite autochthonous.

I have seen absolutely no attempts to clean the face by rubbing it along the ground or branches. The only face-clean-

ing I have seen has been with the tongue (by S).

L apparently cleared his fingers by nibbling at them in the middle of a B performance.

One vocalization by S was rather puzzling. A few single (occasionally repeated once or twice, after brief intervals) rather fart-like grunts or barks. Not obviously correlated with any particular social circumstances. Might possibly have been a low-intensity, or aberrant, or extremely infantile form of B. But none of the time, these fart-like notes were more or less associated with squeaks when S was following L, so they may conceivably have been produced by somewhat similar motivation.

Neither of the Spider Monkeys has shown any positive reaction to the capuchin in the same cage, in spite of the fact that the capuchin has made numerous attempts to "join up" with them.

Ateles fusciceps, I October 3, 1958, Barro Colorado

The 2 monkeys seem perhaps a little less shy today, a little less in the way of Hold. I do not notice much in the way of anything new, but I did observe a few of the things I noted yesterday a little bit better.

L several times gave a series of squeaks, high pitched + thin single notes, before beginning B. I shall call these notes S (although they may not be strictly homologous with the S

Notes of the Marmosets) Much less emphatic than the ♀ of the Marmosets. Sounded very much as if they might be "low-intensity" versions of the regular B.

Three ♂ Notes are probably among the notes I heard given by S the first night (see Oct. 2, p. 2), but they were probably accompanied by others then S certainly gave a number of ♂ Notes quite like those of L today — apparently which he was hostile to me. But he also gave other notes which I probably confused with ♂ of the first night. These are weak Trill Notes, quite similar to ♂ in quality, but with a definite rattle-like overtone, of perhaps 3 or 4 "semi-syllables."

It is possible that these Trill's are purely hostile, and they may, in fact, be intermediate between typical ♂ Notes and the farting Notes (see below). S certainly gave some Trill's in much the same circumstances as ♂, i.e. when he seemed to be irritated or frightened by my presence, i.e. when coming out of Hold, and fixating me, or starting to move away from me. But he also tended to give a burst of Trill Notes when L moved away from him after they had both been Hold-ing and Cl-ing. Seemed to be a protest against L's departure, probably an attempt to call L back. Perhaps thwarted gregariousness, or like call an infant gives when its mother leaves it under natural conditions. (Usually, of course, Trill's by S were followed by S attempting to follow L, but then S always attempts to follow L anyhow.)

S also did more of the "farting" "Barks today. Apparently when disturbed by me. Sometimes intermixed with ♂. I am now fairly certain that these are very closely related to the ordinary B

of L. Perhaps just the first infantile form of B.

I should mention, however, that S has never given more than two or three or four "farting" Barks at a time. Never any trace of the long series of B Notes given by L when she is annoyed.

The fact that S never gives long series of these notes may have implications. It is possible that the difference between S and B (if the "farting" Notes are really B) is more than one of intensity. It is possible that they are produced by different relative strengths of the attack & escape drives. If so, then S must contain a relatively weaker attack component than B. S never gets as aggressive as L. (Sad, this to bite, and then not very hard, when I actually clutch him or pick him up.) S has done very few of the "farting" Notes in comparison with B.

There was also lots of Sct today. I noticed that L did quite a bit of Sct when she was quite silent, apparently just a little disturbed by my presence, as well as during S and all intensities of B. Does this suggest that Sct alone is the lowest intensity indication of hostility (aside from some Hdl's), or does it suggest that the motivation of Sct is qualitatively slightly different from the vocal patterns of the S-B complex.

S also did quite a lot of silent scratching when I approached, and I think that this may have been more than "coincidence."

I saw L clean his hand once more, with lips and/or teeth, instead of Sct, during B.

The fact that some B may be quite low-intensity may

be indicated by the fact that L once took food from my hand and ate it without interrupting a long series of B Notes.

Of course, these monkeys urinate & defecate when they are hostile; and the tendency to do this seems to increase the more disturbed they get. Probably as their escape drive increases, if only one of the hostile drives is involved as a causal factor.

It is perhaps remarkable that, with the possible exception of Jill's by S, neither of these monkeys has directed any display to each other (or to the capuchin in the same cage). All or almost all provoked by and directed toward human beings.

Ateles fusciceps, I October 4, 1958
Barro-Colorado

One new pattern by L, which I noted yesterday but forgot to write down, and now again several times today. When I approach her, she is quite apt to invert her lips a little, particularly the lower lip, so that her teeth are bared (the upper & lower teeth are, however, kept firmly together during this). I shall call this TB. Probably hostile. Obviously very low-intensity. Not usually followed by higher intensity patterns such as G and B.

Both L and S have done a lot of G this afternoon. In the case of L, I am now quite sure that it is very closely related to B, probably only a lower intensity preliminary form of B. In the case of S, however, the situation may be a little more complicated. He seems to give G Notes as preliminaries to both B and Jill!!

This may confirm the interpretation of S as hostile – if the Trill is hostile – see below. On the other hand, especially if the Trill is not hostile, it might suggest that S is merely a more or less low intensity generalized Distress Call, which might be provoked by a variety of frustrations.

S has given several little bursts of "pure" B Notes today. Sounded quite like the lowest intensity B's given by L. Still sounded enough like the "farting" B Notes, however, to suggest that those latter were nothing more than somewhat "stifled", low intensity or particularly alarmed, B Notes. S gave three little bursts of B when he was obviously hostile to me.

Interesting enough, S has not given any "farting" B Notes while I was around today.

I am still rather baffled by the Trill Notes. S has given quite a lot of them today (and L has still given none!) Most of S's Trills were given in what I think of as the "usual" situation, i.e. when L moves away from him after they have been fed together. But I also picked up S in my hands today, and he then gave about 4 bursts of Trill Notes, associated with different types of reactions. Twice just as he tried to bite me in a most aggressive manner. Twice when he wasn't trying to bite me, and was looking away from me, toward L, in a most "longing" manner. It is possible that all these Trill's in my hand were the result of some frustrated gregariousness or infantile reaction to being separated from the parent(s); but no one of them certainly seemed to be hostile. It is hard possible, therefore, that the Trill may be a generalized frustration reaction or distress call, or in process of transition from a

general frustration to a more restricted hostile reaction.

It is also possible that the Q, Vill, and B are merely different intensities of the same motivation, (Q being low, the Vill medium, and B high) — either general frustration or hostility. But I rather doubt it.

Both S and L did a lot of quite silent scattering today when they didn't seem to be hostile. I am fairly certain that some (at least) of this must have been given "autochthonous". In any case physically indistinguishable from obviously hostile Sct.

Both animals continue to do all or almost all their scattering with the hands. I did, however, see S do one little burst of scattering with his hind foot, scattering the side of his neck and his head; but only when he was lying flat on the ground more or less on his side.

His species certainly does not clean the face by rubbing it along the surface of branches or anything else.

And neither animal has shown any indication of an attempt to groom the other.

Ateles fusciceps, I — October 6, 1958 — Barro Colorado

We recorded a number of calls of both S and L today; and this led to, or revealed, some behavior of interest.

We managed to record a few Vill's, some Q, and a lot of B by S, and then played it back to listen to it. S was greatly excited when he heard it, seemed to think there was another spider

Mowbay nearby. He made a lot of movements as if he were trying to go to the recorder, and he also gave lots & lots of calls. The great majority of his calls were Trill's, sometimes very high intensity and loud. He gave Trill's even when the loudspeaker was giving G or B. This use of the Trill was, of course, very reminiscent of the GDC of the marmoset H in somewhat similar circumstances.

We tried very hard to record the shrieks which S gave when pulled up in the hand when we first got him. I caught & beat & slapped & pulled both S and L unmercifully — without success. They simply could not be induced to shriek. This would suggest that the shrieks only occur in a percentage of terror, and the animals aren't that disturbed now.

After letting them go, however, it was quite obvious that L had been greatly alarmed by the whole process of catching, beating and recording. She ran around the cage, around me, occasionally approaching me very briefly, in much the same way that she used to do when she was giving long bursts of B toward me. But she approached me less often and less closely than she used to do, and she did relatively little B. She gave G Notes and a lot of Trills instead!!!

This incident would certainly suggest that both the G and Trill are, or can be, hostile, and that the Trill, at least, can be produced when the escape drive is stronger than attack.

It is always possible, I suppose, that the G and Trill are both still "general frustration" reactions, but the Trill must be less aggressive than B. The relationships between these three vocal patterns still puzzles me, but I am quite prepared to believe that they

are all three closely related. Certainly, that Trill's of S during this incident occurred just when one would expect B Notes during slightly different circumstances. And I am quite convinced now that the "farting" B Notes which S used to give were nothing more than low intensity intermediates between B and Trill. S seems to have stopped giving these "farting" notes now. (It is B's sound quite like those of L, except that he only gives short series of them.)

Atelestes furciceps, I

October 9, 1958
Barro Colorado

I went to watch the Spider Monkeys for a brief period this afternoon, just to see how they were getting along. Not much new.

Lots of fact even before they began to vocalize. I am sure that some of this is not purely interbehavioral in such circumstances. That is, some of the "displacement" scratching occurs at comparatively low levels of motivation.

L is still doing a lot of S and Trill Notes toward me, and naturally little B, in circumstances when he used to do a lot of B and a little S. None of these Trill's seem to be the result of frustrated gregariousness, as L almost never even looks toward S in such circumstances. Either all these notes are hostile, or all are the result of general frustration. I rather think they are all hostile. If so the S is probably both lower intensity and less aggressive than B, and the Trill is probably lower intensity and less aggressive than B but higher intensity than S. (All this is rather tent-

ature, but I am at least fairly certain that the Trill is less aggressive than B, if nothing else.)

I guess S hasn't lost the scream pattern yet. This afternoon I teased him by touching him countertly, alternately on stomach and back. He tended to give a short scream each time I touched him. The tone of these screams was very variable some high pitched and thin, some lower pitched and rather hoarse. Sometimes these notes just rounded off the highest intensities of the G-B complex. The high notes seemed to be less aggressive than the lower pitched notes. Some of the lower-pitched notes, surprisingly enough, were obviously very aggressive. Accompanied by fierce lunging & biting movements, in attempts to bite my hand.

Ateles fusciceps, I — October 15, 1958
Barro Colorado

I took Sound L back to the Gorges today.

I seem to have forgotten one pattern which L performed quite frequently. When I settle toward me, but apparently only defiantly so (i.e. quite silent), she would often have the tip of her whitish tongue protruding through her closed lips. Quite long-sustained, often lasting at least a couple of minutes.

Ateles fusciceps, I — January 19, 1959
Barro Colorado

I took a brief look at a lot of young Black Spiders in a

small cage, and noticed that they were grouping the were of their cage with the fruegis divided 1-3. This would seem to be proof that they are descended from ancestors in which the fruegis were divided 2-3.

Ateles vellerosus

[redacted] = Red Central American Spider Monkeys.

October 21, 1958
Washington Zoo

There are two of these Golden Spider Monkeys here, in a cage with a single Woolly Monkey, and one Panama Black Spider Monkey (fusciceps)

They Hold just like the fusciceps. Also pucker their lips in the same way. Both showing hostile responses to me.

When I first approach their cage, however, they give another reaction. Usually Hold-ing a sleeping (?) before I approach, then left head as I get nearer, and utter a distinctive call. Polysyllabic or multi-note. Usually comme ca: — — — —— or — — — Quality of each note high as theirs. Rather like the Squ or Trill of the Capuchin at BCI or the Black Spider, fusciceps. This is showing homologous with part of the Squ-Trill-B complex of the Black Spiders, but I don't know which yet Probably the Trill ??? Most reminiscent of the Trill's of the S Black Spider I had at BCI. Showing contains a strong escape component, as the Golden Spiders immediately go back into the Hold after giving the call.

Ateles sp. I [redacted] December 26, 1958, Peru

I have seen a number of Spider Monkeys of various kinds during this trip.

The public zoo at Iquitos had a lot of Spider Monkeys in a small cage. Apparently 2 species: Ateles belzebuth (black and white) and paniscus chamek (all black) according to Kellogg & Goldman's review & map. Some individuals of both species seemed to be adult, while others ranged from about 1/3 grown to adult.

All individuals of both species did a lot of following. Moderately loud, including both shrill whistle-like and wood-en-sounding types. Quite like those of Lagothrix in general effect.

Some individuals of both species (at least the younger ones) gave a few single notes which seemed to be Fa# Notes. Some individuals of both species (at least the adults) gave deeper single notes which may have been single B Notes.

The Fall's were most common when the animals were swinging rapidly around their cage, expecting to be fed shortly. Most the Fall's of this species also would seem to include a non-hostile component.

One of the 1/2 grown paniscus did a definite but quite silent V when I came close to him. Hostile call.

Today I watched 2 adult paniscus in the Lima zoo, and one of them also did a silent V to me!

Ateles sp I — June 24, 1959 — Parc Columbo

Several days ago I got 4 Spider Monkeys from the Jorges institute. One Red ♂, fairly small (like a half-grown Black), but probably adult or sub-adult (testes hanging). One Black ♂. Quite large but almost certainly not fully adult, (testes not hanging very much). Two Black ♀'s. One, "Large Black ♀", is just slightly smaller than the Black ♂. The other, "Small Black ♀" considerably smaller — perhaps 1/2 grown?

None of the animals is particularly tame, but they aren't particularly shy either. The Red ♂ is perhaps the tamest.

I think that the two sexes may show a tendency to segregate themselves. At least for the first couple of days, I frequently saw the 3 Blacks sleeping or resting together while the Red ♂ rested some distance apart. (Of course, I do not know the previous history of these animals at the Jorges.)

Their behavior, in general, is slightly different from that of the young Blacks I had before. And the behavior of the Red ♂ is certainly rather different from that of the Blacks — possibly just because he is tamer.

The most common of the more elaborate calls of all the animals is what I shall term "Muffled Barking" (MfB). Apparently uttered in almost or exactly the same form by all the animals. A very rapid series of short rather hoarse and rusty-sounding B. like notes. Apparently of extremely variable length, including very different numbers of notes. When apparently complete, it is usually quite long — but it is definitely organized as a whole into a discrete call — never continued indefinitely for minutes on end

The MfB is presumably hostile – at least in part. The annuals usually give it whenever I appear. It may also contain a "friendly" component. The annuals are used to getting food from human beings. It is apparently never accompanied by such overt hostile cues as actual escape or fear. And the Black ♂ and/or the small Black & ulted MfB's when they were uttering together (see below)

The mouth is apparently opened & closed during MfB's, but only slightly. The Blacks usually don't combine the MfB's with any ritualized facial movements except PL. I am not sure exactly what proportion of their MfB's are actually accompanied by PL It is obvious, however, that some are and some aren't. The Red ♂ usually does PL during his MfB's, and sometimes (but relatively rarely) both PL and OCB (see below).

It is my impression that the MfB's of all the annuals are reactions of relatively moderate intensity. The annuals do not seem to be greatly excited anyway when they utter MfB's.

Brief MfB's sound rather like short, not so distinct, hoarse or rusty Fill's (although they are much less distinctly trilling than the Fill's of the young Red & – see below). They may well be related to Fill's – or even, perhaps, the only Fill-like patterns there & Howlers have – but I find the whole subject of Fill-like notes in these & annuals rather difficult to analyze (see below).

The Red ♂ has a most distinctive OCB pattern. While the lips are pressed in a more or less certain PL pattern, the lips are also opened & closed very rapidly. This is quite conspicuous. The lips are really opened quite far during OCB – without, I think, any much in the way of opening & closing of the mouth in many cases. Many OCB's & PL are quite silent. Others are accompanied by one or two (possibly three or four) brief and rather

soft Squ Notes (often uttered in quite irregular tempo); or brief Fall's (if this animal has a Fall pattern distinct from MfB's; or brief MfB's.

I have not seen any of the Blacks perform definite OCB's.

The MfB's of both the Blacks and the Red ♂ obviously intergrade with Squ's. Some notes are quite like brief MfB's in rhythm, but like single Squ's in quality. Sometimes just a couple of Squ Notes uttered rapidly one after the other. The actual single Squ Notes sound quite like those of the young Blacks I had before. (It is possible that some of the most Fall-like Notes I have heard these 4 animals utter are really intermediate between typical MfB's and typical Squ Notes). It is obvious, in any case, that the Squ's are lower in tonality than the MfB's. Most of the Squ's I have heard are probably also produced by the same types of motivation as the MfB's.

All the Squ Notes uttered by the Blacks have been quite short; but some of the Squ's uttered by the Red ♂ have been quite long. They then sound quite remarkably like the W Notes of the Pwiche's!

I thought I heard one or more of the Blacks utter a definite Fall, more or less like the Fall's of other species, when the whole group was panicked (running in obvious escape) when there was a sudden outburst of roaring by Howlers in the immediate neighborhood

Aside from this one incident, all the apparently high catonal, overt escape behaviors of these 4 animals has been quite silent. Nothing at all like the Squ patterns of the Colus - Saimiri - Harmonet group.

The Black ♂ and the Red ♂ have performed a B pattern which appears to be analogous, and possibly partly homologous, with the full throated howling or roaring of Howlers. The Black ♂ did it both this morning and this evening; and the Red ♂ did it this evening, at the same time as the Black ♂? A very long series of B Notes, uttered

quite rapidly (although much less rapidly than the notes of an MfB performance). Some of these verses may be very very long, lasting 10 to 15 minutes (at least) without an interruption. And long verses after long verses may be uttered one right after the other. This pattern is obscuring the thing I called "Ord B" in my earlier notes (see Oct. 2, 1958, pp. 3 & 4). The two ♂'s gave Ord B almost continually for at least three quarters of an hour this evening, and the Black ♂ gave Ord B almost continuously for almost as long a period this morning; but neither animal gave any hint of it at any other time today. Most peculiar. Again, as in October, I could not locate an external stimulus which might be releasing the bouts of Ord B. (But the Black ♂, at least, was looking fiercely in our direction outside the cage during part of the time he was giving Ord B both this morning and this evening). The Large Black ♀ joined in with a little Ord B this evening, and I presume that she was just responding to the performance of one or both males.

The sound of the Ord B notes is rather variable. When the performance is apparently low-intensity (relatively low-intensity — all the Ord B may well be higher intensity than any of the MfB) the notes are relatively low-pitched and eventually monosyllabic. Such notes are repeated slightly less rapidly than apparently higher intensity notes (see below) and tend to occur during relatively short Ord B performances. Apparently higher intensity notes, more rapidly repeated during the longest performances, are definitely higher pitched (almost "clear," like Squ Notes) and definitely trisyllabic! The apparently highest and apparently lowest intensity Ord B Notes interspade completely (& gradually) by a perfect series of intermediate notes.

As far as I could tell the Ord B performances of the Blacks and the Red ♂ were essentially identical in all respects (although it is just barely pos-

audible that the voice of the Red ♂ is just slightly smaller than that of the Blue ♂s). All the animals open & close their mouths during Ord B. The mouth is opened wider, I think, than during MfB performances, and the Ord B is apparently not accompanied by PL.

These Ord B performances are permanently strictly homologous with the RBB of the adult Woolly I watched in the Lima Zoo.

The Black ♂ has also performed quite a lot of what I called "Agg B" in my earlier notes. Single notes or short series of notes. The individual notes are deeper in pitch than any MfB or Ord B Notes. The number of notes in a single series seems to be quite variable. Seldom more than six or so. Never uttered as rapidly as the Ord B Notes. Frequently accompanied by Jud and/or BT. Frequently uttered as the annual advances, running or walking toward me. Obviously aggressive, probably ranging from moderate to moderately high intensity.

The Black ♂ has also frequently performed silent BT, without Agg B, with or without Jud, toward me. Frequently associated or alternated with Agg B patterns. Probably produced when attack is as predominant as it is during the Agg B patterns, but both the attack and any counteracting inhibition are both weaker than they are during Agg B

The BT pattern of this species is fairly distinct morphologically. The corners of the mouth are drawn back, but not as far as in the BT of the White face. The upper teeth are not displayed by the BT; but the lower teeth are usually or always quite conspicuous. The mouth is always or usually kept moderately open throughout silent BT. Perhaps kept moderately open throughout BT with Agg B, perhaps showing a tendency to close partly between notes. (It is possible that I will eventually have to distinguish between 2 separate patterns, pure "BT and "HD" — when

th open).

Surprisingly enough, the Red ♂ hasn't yet performed anything like Agg B, BT (or MD).

There was one interesting incident involving the Black ♂ and the small Black ♀. Prolonged wrestling. Presumably play; but I noticed that the ♂ frequently mated at the ♀'s clitoris. Accompanied by lots of Agg B by the ♂ or by both animals. With mouth open, probably BT.

Sometime after this, the Black ♂ lay down on a branch to rest. Whereupon the small Black ♀ came up to him and started to groom him. Not very efficient, scattering movements at his back, arms, & back of head. She also "nibbled" at some of his hair (or his arm) with her teeth. I wonder if this was an indication of some sort of potential pairing or sexual relationship between the male and the female?

All these 4 animals perform Act like the young Blacks I had earlier

All 4 animals also did Hdd (with "d") when they were being slipped out to the island in their cage.

Yesterday I also got a young Red ♀. Much smaller than the other 4 animals. Probably less than ½ grown. Possibly no larger than the L Black I had last year. She is certainly not tame, but she isn't as scared of me as some monkeys of other species I have had. I have not put her in the same cage as the 4 other Spiders. Either in a small inside cage by herself or, now, in a small outside cage with the Y Howler and the youngest White face.

This Red ♀ has performed overt escape reactions, Hdd, Act, and BT reactions quite like those of all the other Spiders, but otherwise her behavior has been surprisingly different

When I pick her up in my hand, she utters two different kinds of vocalizations very frequently. One is a short, loud, hoarse scream, beginning and ending quite abruptly. Sometimes these screams are repeated, but they never run together", and they are never organized into elaborate call performances of many notes. These screams are probably quite aggressive, probably directly homologous with the (probably low- to moderate intensity) screams of other species.

The other common call she gives is a note which is similar to the scream in length, and abrupt starting & ending, but is really a short loud whistle. I shall call this WW. It is often alternated or alternated with typical screams (and unusual WW's may be uttered in the same sorts of circumstances as typical screams). In many ways, the WW would appear to be a sort of "segregated variant" of the scream. Either lower intensity and/or less aggressive.

The only other call the Red ♀ gives frequently is a Fill call. This sometimes sounds like a Fill of other species. More often it is rather more like the scream in tonal quality. Quite hoarse. Often rather low-pitched. But never hollow- or wooden-sounding. She ♀ utters quite a lot of these Fill's when I first pick her up in my hand, but they seem to be much less common in such circumstances than either the screams or the WW's. When I pick the ♀ up and take her toward the cage of the other 4 Spider where she can see them plainly, she always utters Fill after Fill, one right after the other, with very few or no screams or WW's. This would suggest that her Fill's may be produced by some sort of frustrated gregariousness or fearful motivation, with relatively little (or possibly nothing?) in the way of hostility.

Several times I have heard the Red ♀ utter 1 or 2 obscure, B flat notes when I held her in my hand. Rather deep & sonorous. Probably

ATELES ssp.

III

It is possible that some (but not all) of what I recorded as "sitting PL" performances by young spiders in my earlier notes were really PL + Snorting.

As a result of my observations of young Reds during the last 2 days, it is possible to make a list of the display patterns performed by animals 1/3 to 1/2 grown:

1. MO
2. BT
3. PL
4. Lsh
5. Sct
6. Squ - WW"
7. Shh
8. B (probably not well differentiated into Agg. and "Ord").
9. Snorting
10. MO & B
11. Screams
12. "Chewing".

Young infant Reds probably perform all these patterns except MO & B as soon as they begin to move around independently a little (although I don't think I have ever seen a really young infant perform BT or Sct which I was sure was really ritualized). The B performances of young infants are probably always shorter, even less differentiated than those of older young.

I have not seen enough of the behavior of both Blacks and Reds to be absolutely sure that there is no difference between them. It seems likely however, that they are either identical or very similar. Possibly the Blacks lack Lsh's. Possibly young Reds do less B than young Blacks. But I rather think that these differences will disappear upon further study.

Today I twice saw Julia pick up a stick with her tail. The first time I have ever seen a Spider do anything of this sort. Quite unlike Cebus. Julia just held these sticks for a while, and then dropped them.

Ateles ssp, I

October 31, 1960
Barro Colorado

This morning I started to water the Reds at dawn. All sleeping all together. Once the 1/4 grown young was sleeping pressed against the adult ♂. Then the adult ♂ woke up and moved away, leaving the young isolated. The young immediately began to vocalize, S-Trills and Screams, all mixed up in random order. Good evidence that S-Trills are still primarily Isolation Calls at this stage.

Ateles ssp I

November 1, 1960
Barro Colorado

Tonight I did a little experimenting with my 2 smallest Reds. (These are both probably somewhat older than Abdominor, although smaller. They are probably both smaller because they have been ill recently, and have always eaten less than Abdominor.) The larger of these 2 small Reds in the "Activity" I mentioned above, p. 35. I shall call him "C". The other is ♀. I shall call her "D". They have both been in cages by themselves quite a bit, because of their illness. They have been kept together in a small cage in the animal house for over two days now. C clutching D pretty steadily.

When I picked them both up this evening, separated them, and then handled them a little, they uttered the usual calls of young Reds in such circ

A few Squ Notes and bits of Screams. These Squ Notes were all (or almost all) short and simple. Apparently low intensity indications of attention movements of the Screams. The Screams themselves were quite variable. No determinate length. The higher-pitched, shriller, Screams were apparently higher intensity in some sense; uttered when an animal was handled particularly roughly.

Both C and D also uttered Trills or Trill-like Notes when handled roughly. These were relatively rare, and not very distinct. They did appear to be trills or nothing more than "intermediates" between the Long Squ's and the more prolonged Screams (see comments p. 407). Very little variation quality.

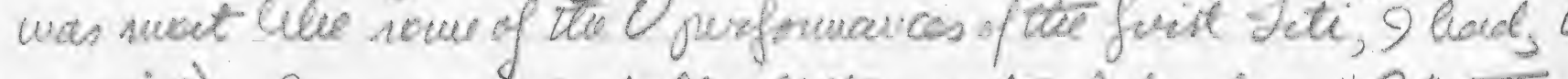
All these patterns, the Long Squ's, indistinct Trills, and in-between note "Screams, appeared to be very strongly hostile.

During short intervals between being handled, both C and D did some short P2 to me. This was definitely short. Also appeared to be purely hostile.

Then I separated C and D, put them on the floor in different rooms, and left them alone. They immediately began to behave in a most unexpected way.

Each animal sat on the floor, without moving very much at first looking rather "puzzled." Then each began to utter Squ's or, much more frequently, WW's, of one type or another. Some of these WW's were quite simple ——————, but most of them were definitely fluctuating. The fluctuating WW's might be transcribed by something like "Wee bee bee." Sometimes even more "syllables." Even the most extreme, quavering, or fluctuating WW's, however, did not have anything like the rapid rattling quality of Trill patterns. Very shortly after beginning the Squ and WW patterns, both animals began to utter single Screams. These Screams

more of determinate length. Moderately long, ending abruptly (more abrupt by train-wrecks, screams uttered when handled). At this time the screams began, or shortly afterwards, the animals stopped uttering bqu's (as usual, these bqu's seemed to be essentially low-intensity and preliminary, probably intention movements of both WW's and screams in these circumstances), and uttered WW's, of both types, and screams in a more or less random jumble. Each note separated by a definite interval. Commonly



As the apparent intensity of the performance increased, the intervals between notes became shorter, and more screams (and fewer WW's) were uttered

Then, after the animals had been separated for some time, C suddenly uttered a new call, which I have not heard uttered by this species before. A brief series of hollow, wooden-sounding, urgent-sounding, bark-like notes. "Huh-huh-huh". Usually only 2 or 3 notes in a series. Never more than 4. Each series followed immediately, after a scream, or, very rarely, a simple WW  These bark-like notes may well be closely related to the "Ord B" of adults, but they sounded incredibly like some of the O notes of Callicebus! Of the 4 kinds of Callicebus are strictly homologous with the screams of spiders — as they probably are — then this performance by the C Red was most like some of the O performances of the Spirit Teti, I feel, the A animal). In any case, I shall call these notes of spiders "O" too.

C gave quite a number of these scream-O calls, interspersed, with a few simple screams, for several minutes; and then retired to a chair (all this was taking place in the dining room), and seemed to relax. Fell silent

Later on, D also uttered Scream-O calls when isolated (By this time, I was carrying C, and it was quite quiet).

These WW, "determinate" Screams, and O calls would certainly appear to have been caused by some sort of frustrated segregativeness. They appeared to be essentially "lost calls".

The reactions of these animals when they heard the various calls uttered during the experiments tonight were interesting. When one of the animals heard the other utter the apparently hostile "indeterminate" Scream it usually retreated to a far corner and "sulked" silently. But the 2 animals tended to answer one another when they uttered WW's and/or "determinate" Screams. One animal would utter 1 note, then the other animal would utter 1 note, then the first animal would utter 1 note again, then the second animal would utter 1 note again, etc. etc. etc. The types of notes uttered were not strictly correlated, however. Sometimes an animal would answer a Scream by a WW, and sometimes the reverse.

The animals also showed a definite tendency to try to approach one another showing their WW-"determinate" Scream performances. Once one of them managed to crawl halfway under the wall separating them. The other immediately rushed over to try to join it. Both animals had been uttering "determinate" Screams when they were far apart, but reverted to pure Squ and WW's, without Screams, when they got closer together. I.E. the WW's are lower intensity than the Screams.

(I might add that I am sure that I have heard other young Reds utter fluctuating WW's before, but I overlooked them because I did not realize that they were really distinct patterns.)

I am sure that the distinction between apparently hostile Squ-indeterminate-Fill-"indeterminate" Scream performances and "lost call" Squ-WW-"determinate" Scream performances is characteristic of all young

Reds. It helps to explain quite a lot of behavior I did not understand before.

I was most surprised not to hear any really distinct, typical, Jills during these experiments tonight.

Later on, however, I gave D a bath. Gave bottle screams, etc., during the actual bathing. Then, as I was drying her in a towel, she really uttered Jill after Jill, all very distinct and "typical", with very clear ~~screen~~ quality. Rather low pitched. Not associated with any other calls or notes. Were these bottle? Or were they the result of some frustrated "infantile" motivation? (It is possible that D is somewhat fixated on towels.) Are the typical Jills the result of frustrated infantile clutching, while the WW- "determinate" Scream - O performances are the result of frustrated gregariousness. Or what???

Ateles ssp., I. November 7, 1960
Barro Colorado

I was outside watching the spiders, when I noticed that Buckteeth was hanging on to the side of the cage nearest me, uttering lots of perfectly distinct and typical SJ Jills, with PL. Obviously wanting to join me. Then, when I came closer to the cage, she began to utter typical MSB's (quite soft - rather like the MSB's of young Reds) Then I repeatedly tapped the wire, right in front of her face. Each time she responded by stopping MSB and doing silent MO + Lsh! Quite like the MO and Lsh of Reds.

How does the motivation of the silent MO + Lsh differ from that of the MSB??

I think that the so-called "V" I saw performed by adult pairs

scus in the Lewis Zoo (see notes of December 26, 1958, p. 17) must have been a form of Lola.

After some reflection, I think I can say the following: 1. Many or all Fells of young Spiders are emitting or probably hostile (including typical Fells with pronounced mmmm) 2. Any Fells which are not hostile are produced by thwarted infantile motivation. 3. WW's (at least the fluctuating type), "determinate" Screams (at least some of them), and O's are produced by thwarted pregenitoness.

This afternoon I caused one of the older young ♂ Reds (it looked a little weak the day before yesterday, and so we have had it in the animal house). It reacted by Screams (indeterminate) at first, but then just kept its mouth open, in extreme MO, with tongue slightly protruding, without uttering a sound. So some MO's can occur without Lola. This MO was certainly hostile.

Which reminds me..... Some bouts of indeterminate Screams decline in a rather peculiar way. The animal continues to open its mouth widely, and close it, as if it were still uttering ordinary Screams. But the sounds become fainter and fainter, and hoarser and hoarser, until (sometimes) I can't hear any sound at all. (I don't take these bouts down through Fgu's.) So some of the "MO"s I have been describing may have been essentially silent Screams.

When I set the older young ♂ Red (mentioned above) loose near the rest of the group, it was obviously strongly attracted to the group and yet afraid (at least of the adult ♂). It attended a bout of typical Fells with mmmm quality, quite loud, interspersed with bouts of WW (of the non-fluctuating type). So some of the WW's may be purely hostile after all.

If the fluctuating WW's and O's are the result of thwarted pregen

courses, why haven't I heard them uttered by all the other young spiders (Bulk tooth, and Cats of Reds) I have kept by themselves in cages in the animal house? Or have I? I don't think so. Perhaps none of the other young spiders I have kept in the animal house was really isolated as a companion beforehand.

Ateles ssp., I

November 3, 1960
Bruce Coleman

Witnessing a dispute between 2 of the medium-sized young Reds this morning. One of them ended up by stroking its opponent repeatedly. With its hands. Obviously aggressive. Each stroke was accompanied by an inaudible scream. Difficult proof that such screams can be aggressive

I think I have forgotten to mention one very common and conspicuous pattern of the Blacks. Reduction attacks. They occur most frequently immediately after one of the adult Blacks has done MFB or MD to me. The animal which has performed this MFB or MD is then very likely to turn away and jump on one of its companions. Sometimes does MFB or MD to the companion. These reduction attacks often lead to wrestling. The ♂'s more apt to perform reduction attacks than the females. This reduction is quite reminiscent of Bully and the other Howlers.

The Blacks almost always perform a lot of "playful" wrestling in late afternoon. Usually involving the male and one of the females. But sometimes the 2 adult females wrestle one another, ignoring the male.

Just before going to sleep at night, the Blacks usually groom one another at length. The grooming animals use both hands & teeth. I have frequently seen the ♀'s groom the ♂, but I don't think I have ever seen the reverse

Ateles sp., I. November 17 1960
Barro Colorado

We have kept C and D (see notes of Nov. 1) together in the same small cage in the animal house for more than 2 weeks now. When today I tried separating them.

When I first approached their cage, D uttered indeterminate Screams and notes intermediate between indeterminate Screams and Fills. Then C utter uttered lots of indeterminate Screams when we picked them up to separate them.

We put D back in the cage and let C run around loose.

D sat in the cage uttering quite distinct and extreme Fills, with L-Fills, plus PL, apparently directed toward (and presumably provoked by) me. Apparently hostile.

C began to walk and run around the floor of the animal house, with occasional pauses while it sat and looked "puzzled." During all this time it uttered determinate Screams and WW's. Just as on November 1. The Screams and WW's were jumbled together, but not randomly. C tended to utter Screams when it was uttering notes very frequently, and WW's when it was uttering notes less frequently. This would suggest that the WW's are lower intensity than the Screams. They certainly sound as if they were lower intensity than the Screams. Many of the WW's sound like Screams which have suddenly "gone thin." It is possible, however, (see below) that the difference between WW's and determinate Screams is quantitative as well as quantitative.

C uttered its Screams and WW's without a trace of PL.

D did not seem to react to its sudden isolation, or to the Screams and WW's uttered by C, in any way remarkable for him. At first, it tended to utter a single Fill whenever C uttered a single determinate Scream

on WW. Uttering the Trill just after C had uttered the Screams or WW. These Trills were still preceded partly by Ateles responses to me. Later on, D tended to answer C's determinate Screams and WW's by uttering brief WW's or even briefer notes, intermediate between WW's and Squ's.

The use of whittle-like notes as a "contact call" by this species is quite reminiscent of Pucke's.

After a while, D stopped answering C's notes.

Then we reinstated the animals around, putting C in the cage and letting D run around loose. C continued Screams and WW's as before; D started to climb around the howler cage, uttering Trills, plus PL.

Then we put D in a separate cage by itself. It just uttered a few more Trills, and then went to sleep and/or ate Food. By this time, C was also growing up. Spent most of the time sitting with its head on its arms. Just ever once in a while, it would lift its head and utter a single WW.

The whole behavior of both animals today would suggest that they were much less upset by being separated today than when they were separated on November 1st. Perhaps they have both become somewhat more used to human beings in the neighborhood. C is still the "clutter" one; and it was the one which did most of the interacting calling today.

I presume that neither animal uttered O today simply because they were not greatly upset by being separated. O is presumably an even higher intensity pattern than determinate Screams.

All the behavior of both C and D today could be explained merely if the determinate Screams and WW's are simply the result of frustrated gregariousness, and the indeterminate Screams and Trills are the result of hostility.

This interpretation must be largely correct, I think. The indeterminate Screams and Trills probably are completely hostile. And the determ

ate Screams and WW's must be at least Carrier & the result of frustrated gregariousness. It is possible, however, that the determinate screams, at least, also contain a more or less distinct hostile component. This is suggested by the following facts.

Once, when C was on the floor uttering WW notes, I moved toward it and it immediately began to utter determinate screams instead of WW.

Even once in a while, when C was on the floor, it would utter quite a lot of WW-notes in fairly rapid succession, without screams. Here WW is caused to be at least moderately high intensity.

If the determinate screams (and O) are partly hostile, it would help to explain why they are so similar to indeterminate screams and also why they [illegible] B in mind. (Some of the indeterminate screams and the determinate screams may actually be identical).

One of the Carrier-wall Reds outside apparently got in a fight with one of the Blacks, and got all the skin scraped off the dorsal half of its tail. We Brought it inside, to give it medicine. Of course, it uttered lots of indeterminate screams while being handled. Then, when we freed it finally, it uttered quite a few screams, at least 6-8 shots, of what I called "Irritated" B. Obviously hostile.

For a long time, we have had 2 young Reds running free outside. They divided quite nicely into 2 groups of 4 each. Each of these groups was also divided into 2 sub-groups of 2 each. One further indication that these screams is not use, gregariously.

We finally put C and D out with the others this afternoon.

(62)

Ateles sp., I — November 22, 1960
Barro Colorado

I watched the cattle Reds very briefly today while they were being fed.

C & D have remained clustering one another almost steadily since they were put outside 3 days ago. But they do separate to feed. This afternoon D apparently satisfied its hunger long before any of the other young Reds. It then approached C and several of the other young Reds one right after the other, and attempted to "clump" with them. C and all the other Reds immediately moved away from D, as they wanted to continue eating. Each time one of the other Reds moved away, D uttered several loud, pure, trills (with cattle or no B2). These trills contain by far the most frustrated grunt-noises and/or frustrated "infantile"

Ateles sp., I — August 21, 1961
Barro Colorado

One of the juveniles of Reds of Brand I came down to the ground and approached me today (while I was sitting near a crag, watching other animals). Did SMell & PL toward me. "Greeting." Chin-up slightly but no eye-closing

ATELES ssp

II

a form of Agg B. We feel that only 1 or 2 of these notes are uttered may be a juvenile characteristic — see my earlier notes on the S Black.

Ateles sp., I. June 28, 1959,
Barro Colorado

I have been carrying around the Red ♀ with me today, in an effort to get her tame. Possibly successful. Most of the time she continued to behave as before, but eventually she settled down quite peacefully in my lap and took little cat-naps. Then when I stroked her, she repeatedly uttered what is obviously a form of Mew!! Quite like the Mew of Alouatta, but softer & less "purring" (it is possible that I have not yet heard this Spider ♀ utter complete or high intensity Mew). Occasionally interspersed with brief high pitched notes which were either brief Whit's and/or Squ's (if there is any difference between these last two patterns).

Ateles sp., I November 14, 1959
Barro Colorado

I got a small ♀ Panama Black Spider Monkey, a couple of days ago. By far the smallest baby Spider Monkey I have ever had.

Her general "grasping — parental" behavior is peculiar. She is either so young that she tries to grasp and hold on to any large animal which might conceivably be her mother, or she has been frightened by human beings already. In any case, she tries to climb on to any human being who comes close to her. (She is also probably frightened of human beings. At least, when she is prevented from climbing on me she goes into a full well-de-

clasped Hdd. She also tends to go into Hdd when she is touched on the back — i.e. touched in such a way that she can hardly try to climb onto the touching hand.)

When she is prevented from climbing on to a human being, she always (except when eating — as below) keeps her arms crossed over her chest, each hand clutching the shoulders or upper arm of the opposite side!! In other words, she "has" to feel that something is being clutched in her hands! At the same time, her feet are frequently grasping each other, and her tail is always tightly wound around her body and/or limbs. In other words, all her "grasping" surfaces "have" to be in contact with something firm (probably something moderately hairy as well) before she can be even moderately content. But she certainly prefers to be grasping me, rather than herself, if she can manage it. In other words, she will stop grasping herself and come to me if I come close to her.

I tried some experiments putting her in a tree yesterday. When I pulled her up, by the back, she immediately went into a little ball, as usual, grasping herself in all directions. Then it was very difficult to get her to grasp a branch of a tree. She wanted to continue to grasp herself, and fell off the branches several times more, because she made absolutely no effort to hold on. Finally, after repeated experiments, she started to grasp branches with her hind feet, but it was only much later, still after many more experiments, that she started to use her hands and tail a little!!

Unlike other Spider Monkeys I have had, this little animal doesn't use its hands at all to grasp or pass through food. If it has been grasping itself before starting to feed, it will use all sufficient to put its hands on

the grass as pups, but it will always pick up the food with its mouth and lips.

Unlike most baby monkeys, this little animal seems to have absolutely no escape reaction of any sort. Absolutely no tendency to climb up and away from any frightening or disturbing stimulus. Never anything but Still.

She doesn't seem to be at all upset at being thrown about or dropped or swung from hand to hand (unless she falls and experiences actual pain). Quite silent throughout. Only now once in a while, if I actually stand her on her head on my hand, will she utter a not my usual "Distress Call-Fall" (see below). She always remains curled up in a tight little ball, grasping herself, no matter how hard I throw her around. Absolutely no attempt to put her hands or feet out to brace herself for landing with a thump.

I am fairly certain that most of this curling up, grasping herself, behavior cannot be due to fear or alarm in any way.

Her vocalizations seem quite limited in scope and variety, and quite difficult to analyze.

The main vocalization is a Fall. This is probably a sort of general Distress Call, as a whole. But it usually appears as a "Fall Call". In other words, at least 90% of the Falls she utters now occur when she is separated from me or any other human being and cannot climb back on.

This brings up an interesting point about the stimuli releasing the Fall Call-Fall. She utters Falls when she has been clinging to my hand and I try to take her off. She also utters Fall's for the first few seconds after being taken off. She also utters Fall's when she has been off me for some time, and I present my hand near her and she starts to crawl toward it. She does not [underlined] routinely [/underlined] to utter Fall's if I present my hand to her on the ground and then gradually withdraw it as she crawls

forward. What she does then is follow the hand for a while, continuing to utter Fill's while she does so, and then stop following and shut up at the same time. Similarly, she will continue Fill's for a few seconds or minutes after being taken off me, but will then shut up if the Fill's don't result in her being taken up again. In other words, she continues Fill's as long as she thinks there is any chance of being allowed to grasp the parent or parent substitute, but she doesn't continue them indefinitely, no matter how unhappy she may be at being still left alone. Contrast with the "Lost Call" vocalizations of baby Howlers. Could evidence that the Lost Call Fill's of the baby Spiders are definitely social signals. Also good evidence that they are very rapidly "exhausted" or "negatively conditioned", temporarily, when they don't produce the appropriate result.)

(Another interesting aspect of the stimuli producing the Lost Call Fill's is the way in which new stimuli can release them again after they have temporarily subsided. Thus, for instance, if I take the little animal off my hand and put her on the table close by me, she will utter a lot of Fill's for a few seconds but then subside if I don't allow her to climb back on me. Then, however, if I get up and go out of the room she will utter a whole new burst of Fill's from the moment I start to leave until a minute or so after I have disappeared. Usually, without attempting to follow me. Incidentally, this sort of behavior may be good evidence that the stimuli releasing infantile behavior and distress calling can be purely visual.)

(Also in connection with stimuli, it should be mentioned that this little animal, like all the other baby monkeys of other species I have kept, definitely prefers to grasp and/or sit on a turkish towel rather than the flat cold surface of a table or the floor.)

The only other circumstances I have ever heard Fill's uttered in were once or twice when I ran cold water over the little animal; and once

or twice when the animal was very startled, and obviously flinched, when someone suddenly appeared very close to her unexpectedly. These are really the only incidents which indicate that the Pll, at the present time, is really a semi-generalized Distress call rather than a pure and simple Fear Call.

(It is not, however, produced in all situations of high intensity Distress. If one repeatedly bats the little animal, for instance, she Pll's, grasping herself, sometimes simultaneously flattening herself on the ground, but she does not utter Pll's.)

The actual sound of the Pll's uttered by this little animal are much the same as those of other young Black Spiders I have had. Quite loud and usually quite hoarse in quality. As loud as the L-Pll's of young Woollies but not at all wooden-sounding. Usually four short, 3 or, more often, about 5 "syllables" sometimes appreciably longer, however. Usually I think, given with open mouth.

The highest intensity Pll's, given when I am moving away from the animal and have got a considerable distance away, are loud, long and shrill. Often rapidly repeated and very urgent-sounding. They are not only shrill, but they are much less "rattling" than ordinary Pll's. In some cases, the "syllables" are so little apparent that each Pll sounds almost like a single long Wail or Level Note of a Fife!!! This may be of the highest intensity, comparative interest!

Another common pattern performed by this little animal is a PL. Usually or characteristically silent, but if often follows immediately after a burst of Pills, and then the Last few Pills may be uttered after the animal has closed begun PL (but the PL is then usually continued after the Pills have stopped). This PL is quite similar in form to the P2's of other animals species, but its circumstances are often a little peculiar and enigmatic. It is most commonly performed in the following situations: after I have taken the animal off me

she sits on the ground and utters Fill's. Then, after a while, she may suddenly tilt her head backward, so that the chin and mouth point diagonally upward, and do silent PL toward me, looking "down her nose" straight into my face, just before going down into Hold! She can be provoked to do it again if I keep moving my hand toward her. Each time she follows for a few seconds, uttering Fills as she does so, then stops dead, looks at me for a second with her head tilted upward and PL, either silent or with continuing Fill's, and then goes down into Hold.

Such reactions would suggest that the PL is either lower in status or more hostile than the Fill. I think it is more hostile because of the following incidents. If I let the little animal go by me, she settles down quite peacefully and quite silently for a while, but then she seems to become somewhat uncomfortable, and starts to readjust herself & move around. She shows a definite tendency to move upward at such times. She also usually utters a few Fill's and does a lot of silent PL's, as usual looking straight up into the face of the person holding her when she does the PL's. This afternoon she behaved in this way when grasping Arlene, and this time she uttered a call which was definitely reminiscent, and obviously related to, the B of older animals as she looked up into Arlene's face with PL!!!

Her B-type call was very interesting. Quite like the B of older animals, but softer & hoarser. A lot of notes uttered very rapidly one right after the other, almost running together. The individual notes were not as well separated from the "syllables" of a single Fill. Her whole call, the whole series of "B" notes, in fact, sounded very much like a Fill in which the "syllables" had become more clearly separated and more explosive!! All this would suggest that the Fill and B patterns have barely begun to be segregated in this little animal!!!

All this would suggest that frustration without isolation includes inactivity sounds quite plausible on general grounds.

One other sound uttered by this little animal may be a "real" howler utterance dutters call. Sometimes, but by means always, she utters a loud hoarse-sigh "Ough" or "Ough" note right at the end of a series of falls. I shall call this note "O". It sounds very much like a whisper-fall without any "syllables" (or a whisper Wail of young Howler without any plaintive quality). This little animal uttered quite a lot of O's yesterday in much the same circumstances as many RL's. When I put her on the ground and then gradually withdrew my hand before her. She alternated periods of following with Fall's and sitting in Hold. She frequently uttered O's just as she stopped following with Fall's, just before she went down into Hold. Unfortunately, I didn't determine the relation-ships between O's and RL's in these circumstances. I think that the animal tended to utter O's when she didn't perform RL!!

It is possible that this animal also has the faint trace of an Hen pattern. After I feed her, and she is lying on her back in my hand (not being able to grasp me), she often utters a series of very soft, little "breath-y" or whispering grunt-like or snort-like noises. These "snorts" are often repeated quite rapidly. Some of the individual "snorts" sometimes seem to have a slight buzzy or trilling quality, without becoming any louder than the usual "snorts", and they are just slightly reminiscent of Hen Notes in actual sound. I will be interested to see how they develop.

When hungry, this little animal performs "chewing" movements and utters "chewing" sounds just like young Howlers.

I think I shall call this animal "Buster."

November 15, 1959
Barro Colorado

This afternoon, when I pulled up Buster, she gave a real complete, but very soft, Mu Mute. Repeated about twice. Hes did not intergrade with "snorts", although it was similar to them in softness, and not too dissimilar in quality.

Hers correction of addition to yesterday's notes. Low-intensity Hells (and all Hll's with PL) are uttered with the mouth closed or almost closed, but high intensity Hll's are uttered with the mouth quite widely open.

When sitting peacefully on my head now, Buster was uttering a lot of soft "snort"s like yesterday, without a trace of Mu. So I think that the "snort"s and Hm must be qualitatively different in origin. It may be significant that immediately after this period of uttering "snort s", she started to utter Hll's, perform PL, and climb up my arm, uttering a few B Notes when she got close to my face. Then when I pulled her off, she uttered a lot of Hll's, and then subsided into Hll, groaning heavily, and started to utter more "snort"s. I am beginning to think that the "snort"s may be low intensity versions of the Hll complex.

(I wonder why Buster didn't utter any O at this time?)

Again, I let her rest on my head and then climb up my arm. She behaved just as before, Hll's & PL, changing to B's (total with PL, 9 times), just as she got up to my face. In neither case, did Buster make the slightest attempt to bite me when she got up on my shoulders and neck. When she did get up, she obviously found it difficult to get settled, and wandered around, uttering more or less regularly alternating

!!

Counts of B and Fill's. Again with no attempt to cite.

This behavior would suggest that some, at least, of the B's uttered by Baxter now - are not baritte Perhaps generalized distress - higher intensity than the Fill's?

Finally, Baxter manages to find a comfortable place on my shoulder, and she then subsides half-asleep. While she utters its fairly quiet, she assumes uttering a lot of "snorts." (I think I shall call these "snorts" "SN"). Then gradually, apparently as she calms down even further, she starts to utter a lot of typical Mm Notes.

This behavior would suggest that all four vocalizations, B, Fill, SN, and Mm are all produced by eventually the same emotion at different intensity levels. B represents highest intensity, then Fill, then SN, then Mm at the lowest intensity.

Baxter is now resting on my shoulder apparently absolutely peacefully, and Mm-ing madly - and really quite loudly. As soon as I move a little she shouts up, without assuming other calls. This behavior might suggest that the Mm is a real contentment note after all!!!

Attles sp, I November 18, 1959
Barro Colorado

I have returned from a short field trip to Cerro Bruja to find Baxter's behavior unchanged except for two possibly significant details.

First of all, she is perhaps becoming a little less absolutely dependent. Arleen says that she saw Baxter climbing quite independently on a branch in her cage yesterday. And sometimes, if I drop Baxter rapidly toward the floor (still holding on to her hind legs), she

will spread her arms a bands, in order to receive the shocks of landing which she expects. (This still doesn't occur always, however).

It is also noticeable now that her Bell's sometimes "fade off" into little Squ-Celic sounds. These little Squ-Celic sounds are not, however, distinct enough yet to be considered a really separate pattern yet. (It is possible that Buster uttered a few Squ-Celic sounds also when I first got her; but they were definitely rarer and even less well segregated then.)

Ateles ssp, I — October 29, 1960
Bruno Colorado

Unfortunately, Buster died some time not too long after the last is recorded above. Before its behavior changed much, or, at least, before I paid any attention to its changing behavior. Since then I have acquired a lot more Spider Monkeys. Lots of Reds, which have been let loose — see separate notes. Also 1 more ♀ Black. This new ♀ Black ("Buck tooth") is now half grown or a little more. The other 3 Blacks seem to be quite full grown now. I have not been paying much attention to the behavior of either Reds or Blacks, until late today, but I have observed them a lot, without taking notes, and I now find myself with all sorts of miscellaneous data to record (some of it not very precise), and I hardly no where to begin.

Perhaps it would be best to start with the behavior of infants. I have not had any infant Reds as small as Buster, but I have one, "Abdomen", which I got early last Summer, and which was not much larger than Buster at first. A ♂ But definitely much more independent than Buster from the very beginning, very tame (I

tried, successfully, to keep him from getting any taller) and very active, moving about its cage very frequently of its own free will.

When we first got him, Abdomeno's most frequent reaction to my appearance was silent PL. Done with mouth closed. Head tilted with chin raised a little. Eyes just slightly closed. This pattern is obviously partly hostile and partly fearful. At this stage, Abdomeno was almost as likely to come toward me as move away from me. Sometimes even climbed up on me of his own free will.

Abdomeno still does silent PL toward me quite frequently when I am a few feet away from him; although he always moves away from me now when I come closer. Two other infant Reds, smaller than Abdomeno is now, although probably larger than he was when we first got him, behave in the same way: alternately silent PL toward me when I am some distance away, and then retreating when I come closer. (One of these two infants is ♀, the other is ♂. The ♂ is still somewhat "clutchy", tending to grasp her companions whenever possible.) Another young Red, a juvenile ♀ perhaps 1/3 grown (or just slightly more) also reacts to me in exactly the same way. The silent PL patterns of all these animals are identical in form, accompanied by the slight chin-lifting and eye-closing.)

The adult Red and Blacks, and the other juvenile Reds, do not do this silent PL to me, or, at least, do it very infrequently. Probably because they are not tame enough.

Buckteeth, the youngest of the Blacks, has always done silent PL to me. Did it when she first came, when she was no more than 1/4 grown, and still does it. She is by far the tamest of the Blacks. When she first came, her PL usually revealed her upper incisors quite conspicuously (this is how she got her name), but now most of her PL performan

axes are close with the lips meeting and the teeth hidden.

I am certain, incidentally, that the PL + OCB of the adult ♂ Red described above on Jan. 24, 1959, p. 17, was accompanied by slight chin-raising and eye-closing, just like the PL's of the young Reds.

None of the Reds or Blacks I have now have done any OCB like that of the adult Red described above.

Another pattern or group of patterns which Abdomeno performed quite frequently when we first got him was MO + Fsh. Again as a response to my approach. Mouth opened very widely (with little or no trace of BT), and the head shaken from side to side, (usually approximately 2, 3, or 4 times, while the mouth remained open. This shaking was only moderately rapid, much slower than the V of young Woollies. During some MO + Fsh performances, I think the head was tilted in just the opposite way from during silent PL's;

← Comment

this MO + Fsh performance also appeared to be both friendly and probably stronger than in the silent PL. Abdomeno, the friendliest of the young males, is the only one who has ever directed MO + Fsh at me. It is possible that the hostile components are also stronger in MO + Fsh than in the silent PL – although I rather doubt it (see also notes on MO + Fsh of adult ♂ Red below). See also note p. 38

All the young Reds have been remarkably silent on the whole & the silence of the juveniles may be partly due to the fact that they are not tame, but Abdomeno was also very silent, even when we first got him.

Abdomeno and some of the other young Reds have uttered FCLs occasionally. Relatively long, soft, thin and "pure" in tonal quality. Usually or always with PL just like the silent PL, and also usually or always

directed toward me. But Abdomeno never uttered many Wills, even at his tamest. This would appear to be very significant. Abdomeno probably didn't utter many Wills because he was independent by the time we got him.

In the case of the Blacks, it is fairly evident that the Wills begin as a frustration pattern, probably largely or completely a host call, in young juvs. and then become largely or completely hostile in adults (see notes below).

The development of Wills in probably the same in Reds. If so, Abdomeno's behavior would indicate that once an infant becomes more or less independent it stops giving Wills frequently.

All the young Reds utter screams when picked up. Sometimes very harsh, sometimes higher and thinner. I think that the higher and thinner types contain a stronger escape component.

The infants and young juvenile Reds have not uttered any B Notes. Even when they fight among themselves, they utter screams rather than B. The B pattern is must be considered essentially adult. It is possible, however, that young Reds are capable of uttering some B, like the S young Blacks described above. It is possible that my young Reds have not uttered B because the circumstances have not been right. B may be suppressed by fear, and all my new young Reds except Abdomeno have been shy. And I never teased or irritated Abdomeno in a way which might be expected to provoke B.

There are indications that B patterns first appear, or first begin to become "regular" when the animals are about ½ grown, (when they are "older juveniles" in my terminology). See notes on capture of Red on June 24, 1959, p. 24, above. And today my 2 oldest juvenile Reds, both ♀'s, one a little less than ½ grown and the other a little more, engaged in "playful" wrestling, just like that of adult Blacks (see below). With MO, and MfB by one or (more probably) both animals. These MfB's were quite like those of adults in sound, but definitely much weaker.

Some of my young Reds have uttered one or a few Squ-type notes from time to time. I am becoming convinced, as a result of my observations of both young and adult Reds and Blacks, that all or most of the Squ's are nothing more than low-intensity indications of other notes. Probably indications of different types of other notes in different circumstances.

(After writing the above accounts, I went back to look at the young Reds, and saw one young juvenile direct MO + Fslr toward another.)

The behavior of the adult Blacks has not changed very greatly since June of last year. The principal difference is that they are a little less strongly aggressive toward human beings now.

The decline in their aggressiveness is shown by the fact that none of them has done Agg B toward me recently, or performed more than very slight Jud.

They usually respond to my appearance as follows. The ♂ usually rushes over to me with bats of Ntf B, occasional silent MO. The ♀ is usually rush over with bats of silent MO, but little or no Ntf B

Rather surprisingly, none of them has performed any extreme BT, with corners of mouth drawn way back, recently. I am even beginning to doubt that this species has a really distinct BT pattern apart from MO. Probably it has, but, if so, it must be largely or completely confined to very high intensity aggressive reactions.

The Black ♂ still becomes very aggressive toward me from time to time. In such circumstances, he does not utter Agg. B as before, but another pattern which I probably overlooked during earlier observations. I shall call this pattern "the Roar". When the ♂ is particularly aggressive, when he rushes over particularly rapidly, tries to bite me (through the wire of the cage) particularly vigorously, he usually utters one or more very low-pitched, "throaty" sounds which sound almost like the roars of

large felines. Very variable in length sometimes long and continuous, sometimes often broken up into separate notes, but the separate notes are always or almost always longer than any B Notes.

• These Roars also sound very much like low-pitched versions of Screams (although they occur in very different circumstances — see also below), and their visual effect is at least sometimes similar in some ways. The adult ♂ Red spends most of his time sitting on top of the cage of the Blacks. He usually does not respond when the Blacks Hf B & MD sit me. But when the ♂ Black Roars, the ♂ Red usually rushes over toward me, apparently preparing to attack (just as the other adult ♂ Red I had (the one who is over by Fourteen House) attacked me when I pulled up a young one and it screamed.

Since the Black ♂ Roars at me now, when he no longer utters Ags B, the Roar must be either lower in tonality than Ags B or contain a markedly consonant element in Ags B. Quite possibly the latter. The deep throaty quality of the Roar is not unlike the quality of the undoubtedly purely friendly Hf B (see below). It is probably naturally less friendly, however, than the Hf B, as it is apparently never uttered during friendly wrestling between the ♂ and ♀'s (see below). (In any case, friendly or not, the Roar is undoubtedly very aggressive.)

The deep pitch of the Roar is quite similar to the pitch of the Ags B. It has occurred to me that the Ags B may be intermediate, in some sense, between Roars and "Ord. B".

I do not think that I have heard the adult ♂ Red utter any Roars. Certainly none of the young Reds have.

All the Blacks utter Hills now, but they have been very rare until yesterday, when we let all the Cattle Reds loose and there was a good deal of excitement in the whole group. Some of the new young Reds tried to

climb on top of the cage of the Blacks. This always infuriates the adult Blacks, especially the ♂. Every time a new young Red tried to climb on top of the cage, especially when the oldest new Red (the one that is slightly more than 1/2 grown) tried to do so, the adult ♂ Black would rush over toward it, uttering lots of B's (probably both Agg B's and Mfg B's), and lots and lots of Yells. Also trying to strike at the Red, and bite it, and performing Jud. The Red(s) always ran away screaming.

It was noticeable during such encounters that the ♂ Black tended to utter most of its B's when first rushing toward the Red, and then mostly Yell's as the Red fled. Contrawise lots of Yells, without B, after the Red had left the cage and taken refuge in a nearby tree.

Also uttered lots of Yells without B, from time to time, in mid-encounters, when a Red didn't even come to the cage, but just reacted to move about conspicuously in nearby trees.

The Blacks (and probably the Reds) seem to have S-Yell and L-Yell extremes, but they are connectedly intermediates. S-Yells are the usual type uttered by the Bucktooth Black and most of the young Reds toward me. This is the type I refer to in most of my early descriptions of Yells. Thin, high-pitched and fairly soft. The L-Yells are much louder, wooden- and hollow-sounding. Most of the Yells uttered by the Black ♂ during the disputes with young Reds were L-Yells. Intermingled with a few S-Yells and intermediates between typical S-Yells and L-Yells.

Many L-Yells ended with a particularly heavily "Eeyah" scream. [redacted] Sometimes this "Eeyah" developed into a definite Cut-bit of scream.

What are the causal differences between the Yell patterns (plus scream, if this is definitely a regular part of the Yell complex) and the

and the Agg B, "Ord B", MS B and Roar patterns, as they occur in the repertories of adults ??? (1) All or most of the MS B and Roar patterns seem to contain a friendly component as friendly patterns, the Roar is obviously more aggressive than the MS B — probably also higher intensity on the average. If the MS B and Roar are ever purely hostile, then the Roar must be as aggressive as any Agg B, but lower intensity than Agg B on the average, while the MS B must be less aggressive than the most aggressive Agg B, and also probably lower intensity on the average. (2) The Agg B is probably actually high intensity, and contains relatively aggressive. Apparently never contains a friendly component. (3) The "Ord B" is perhaps the most typical Agg of the lot, as an adult pattern. None of the adults have uttered "Ord B" recently. "Ord B" is obviously very high intensity, probably even higher intensity than Agg. B on the average. Perhaps less aggressive than all or most Agg B on the average. Apparently (?) hostile. Perhaps a purely long distance pattern as an adult pattern (4). The Fill (with Scream?) would seem to be less aggressive than any of the B + Roar patterns, on the average (with the possible exception of some or all "Ord B". Independent screams are certainly high intensity for patterns (see notes above and below). And even L Fills do not seem to be accompanied by the extreme Jud and attack wit. moves of many Agg. B's and Roars, and some MS B's. It is surprising, therefore, that the adult Black & uttered L Fills so frequently when the Cattle Reels were moving away from him or in trees some distance away. Perhaps the Fills of adults are partly long-distance patterns. Perhaps the Fills of adults are still partly "Lost calls", attempts to summon mother animal, like all or most of the Fills of young infants. The L Fills would appear to be higher intensity than S Fills (if the S Fill is really an adult pattern).

The adult Blacks of Tuttered one burst of 3 or 4 squ or squ-like notes today, after an outburst of all sorts of otter calls. As noted above (p. 38), there might be low intensity indications of almost anything. I do not think that the squ's of adults should be considered a separate distinct pattern. (These squ's of the Blacks of Tuc were quite like those of young animals in actual sound, but louder and harder).

It might be convenient, at this stage, to list all the displays known to be performed by adult Blacks, including some patterns which may not be very distinct or typically adult.

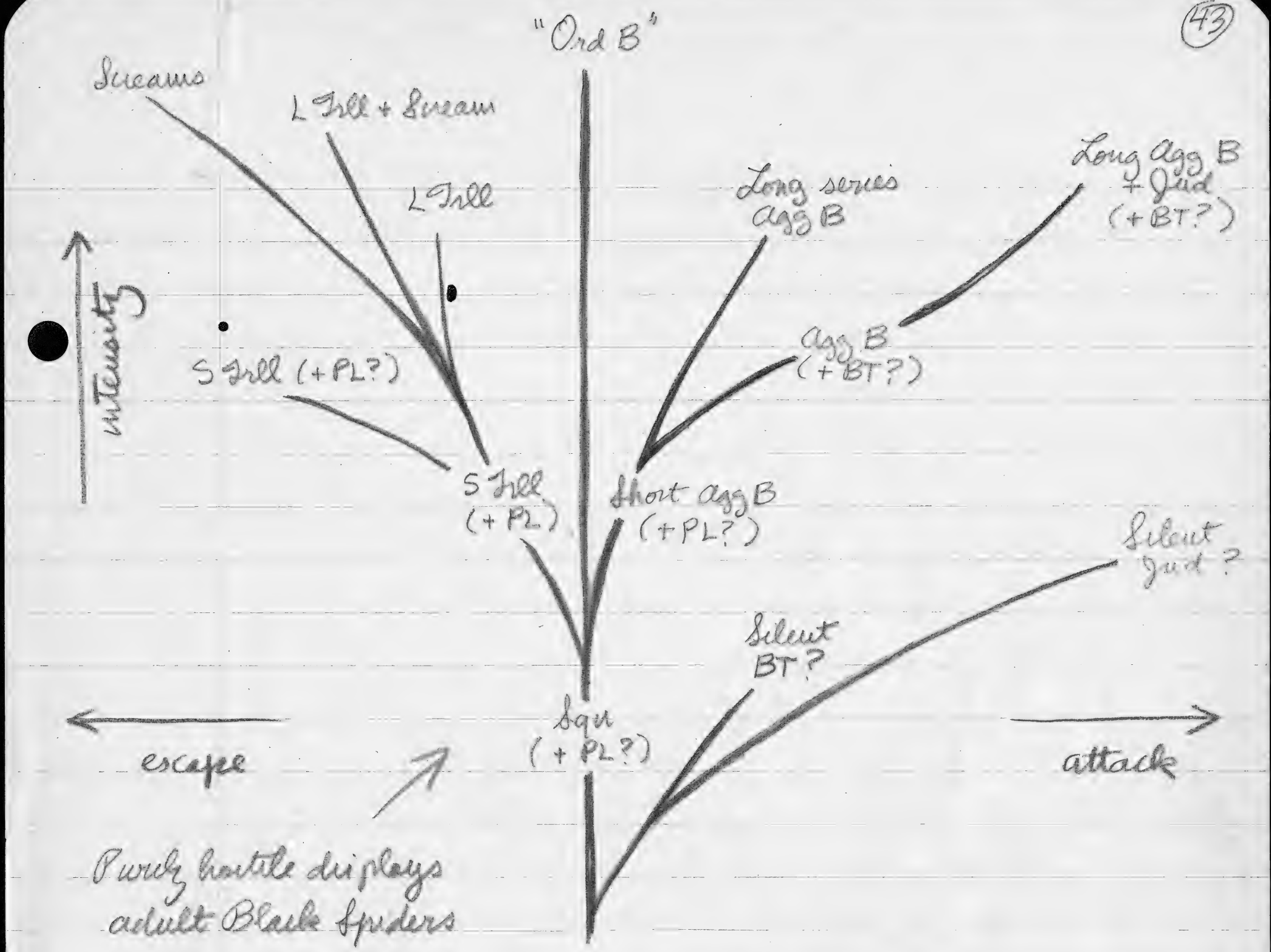
1. Jud
2. MO ✓
3. BT
4. PL ?
5. Sct
6. Squ
7. SFill
8. LFill
9. AggB
10. "OrdB"
11. MgB ✓
12. Roar ✓
13. Scream

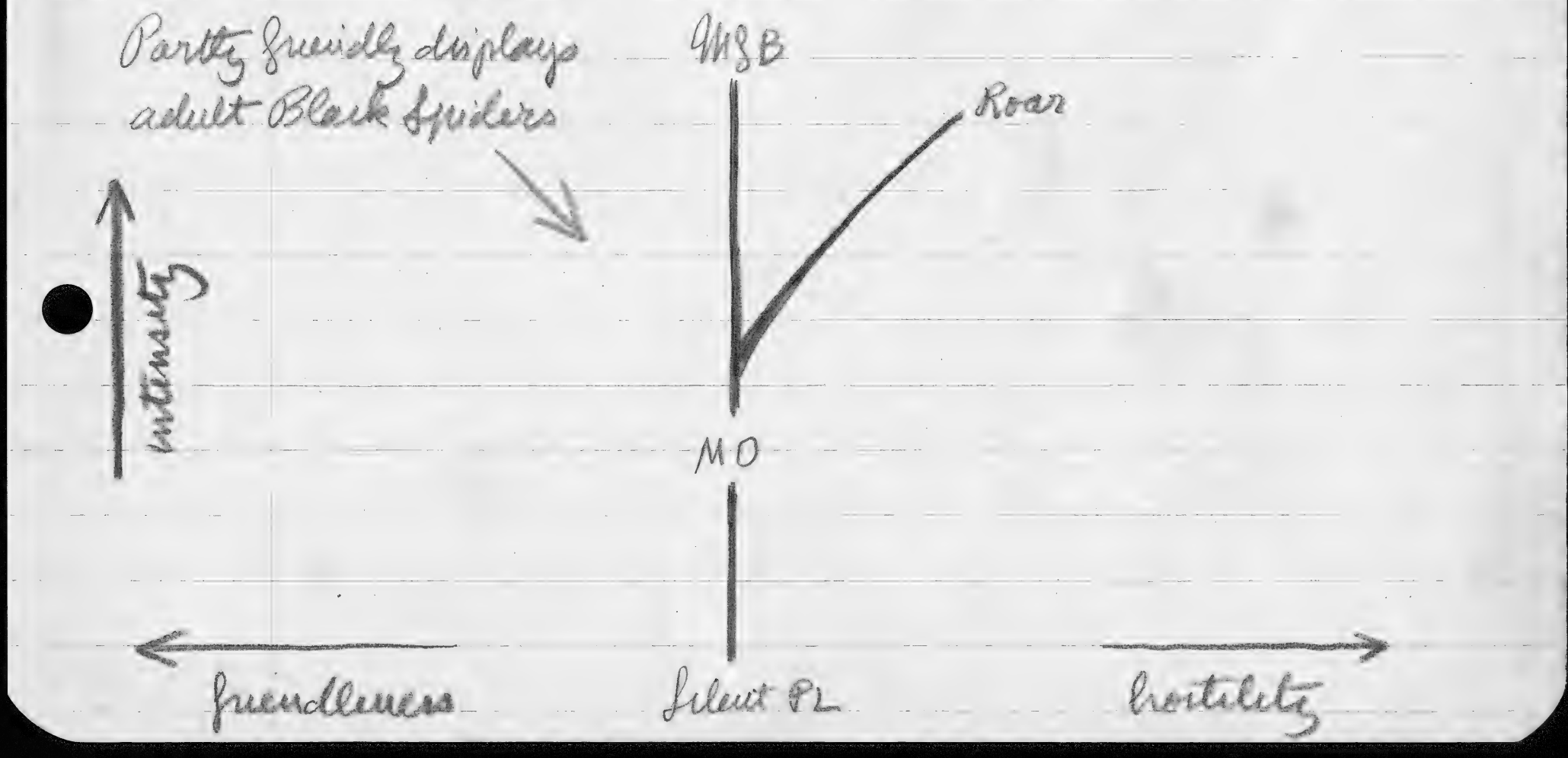
Patterns known to be frequently or always, partly, fluently, are marked ✓

Patterns probably sometimes fluently, as adult patterns, marked ?

This list is almost certainly not complete. It does not, for instance, include some of the patterns known to be performed by adult Reds, i.e. OCB & LSh (see below), although I rather imagine that the repertories of the Blacks and Reds will eventually be found to be qualitatively identical.

The motivation of these patterns may be represented by the follow-


"Ord B"
Screams
L Trill + Scream
L Trill
Long series agg B
Long agg B + Jud (+ BT?)
agg B (+ BT?)
S Trill (+ PL?)
S Trill (+ PL)
Short agg B (+ PL?)
Silent Jud?
Silent BT?
Squ (+ PL?)
intensity
escape
attack
Partly hostile displays adult Black Spiders


Partly friendly displays adult Black Spiders
MSB
Roar
MO
intensity
friendliness
Silent PL
hostility

At one time, just after letting all the little Redsgo, I thought I heard one of the Blacks utter M's or M-like notes. But unfortunately I can't be sure of this. If there is an M in the repertory of this species, it is presumably friendly or partly friendly.

I paid particular attention to the mouth and lip movements accompanying the various calls of the adult Blacks during the evatement today.

S-Fills are usually or always uttered with the mouth closed, with at least a trace of PL. High intensity L-Fills are accompanied by slight but definite opening and closing of the mouth, with each complete L-Fill Note, but no PL. The mouth is moderately open, more or less, throughout both series of MfB's and series of Roars. Tending to close a little between successive notes, but never closed completely. No PL or BT.

The adult ♂ Black and one of the adult ♀'s performed some interesting behaviors this afternoon, quite apart from any reaction to the Reds. Lots and lots of wrestling. Obviously partly hostile. Also obviously partly friendly and/or sexual. Went on almost steadily for almost 2 hours. Mostly on the ground, sometimes on branches. Usually, but not always, the "aggressor" Whichever animal was initiating a bout of wrestling would approach the other, and throw its arms around the other, or pull its tail or some other part of its anatomy (not the sex organs). This would lead to all-in wrestling. Lots of sloppy embracing and rolling around. Lots of biting and biting at wounds, some of them apparently serious. All this was accompanied by nearly constant MfB's and silent MO's by both animals. The ♂, as usual, did more MfB's than MO's, while the ♀ did more MO's than MfB's. Not a trace of any other call besides MfB. This, plus the absence of actual fighting, would seem to be conclusive proof that this wrestling was not purely hostile. There are 2 reasons for supposing that the non-hostile component during this performance may have been

sexual rather than fight friendly. 1. The ♂ spent almost all the time west living with the same ♀. He ignored the other adult ♀ completely, and west had with the young ♀ (Buckteeth) only once, very briefly. 2. Comparison with the behavior of the adult ♂ Red.

When we first let the young Reds loose, the adult ♂ Red came over to investigate. The adult ♀ Red, slightly more than ½ grown came over to him as soon as he approached. Immediately, threw her arms about his neck, and brought her face close to his. Probably a form of SNF. Perhaps also an init. mov. of grooming. The ♂ responded by uttering FtfB's and performing repeated Fdh's. The ♀ turned, retreated, but came back again very soon, and the two animals began to wrestle in a rather clumsy fashion. For quite a long time. The ♂ continued to do quite a lot of FtfB's + Fdh's during the first part of this wrestling. Then became more silent as the wrestling continued, uttering only a few bursts of FtfB from time to time. The ♂ also did silent MO at various times during this wrestling (probably without Fdh's). Finally, the 2 animals separated — and I saw that the ♂'s penis was erect! This is the nearest thing I have seen to sex so far.

I neglect add that SNF seems to be quite a common reaction when ever two strange spider monkeys, either Black or Red, meet one another. Usually silent. Apparently unintended. Quite variable in form. One animal may try to SNF face to face with the other, or SNF almost any other part of the other's body. Face to face is most common, but other forms are by no means rare. I have never, however, seen anything like stereotyped mate to mate SNF.

I forgot to mention above, that the adult ♂ Red and the adult ♂ Black sometimes FtfB at one another, face to face, through the wire netting of the Black cage. Sometimes accompanied by silent MO by one or both

animals. As the Blacks also NJB and MO to me, it seems obvious that these two patterns are the usual "greeting" patterns of the species.

This evening, around 5:00 p.m., I watched the Blacks going to sleep. All sprawled out, close together. One of the adult ♀'s spent some time grooming or carrying the adult ♂, using her hands for this process. Quite silent throughout

For comparison with the list of the displays of ♂ adult Blacks shown on p. 42, it may be useful to list the displays definitely known to be performed by adult Reds:

1. Jud
2. MO
3. ET
4. PZ
5. OCB
6. Fsh
7. Sct
8. Squ
9. 5 Hll
10. "Ord B"
11. MJB

Apparently produced by same motivation as corresponding patterns of adult Blacks

(I have not yet heard adults of this species utter 2 Hills, Ord B, Roars, or Screams Probably because I have not seen them engaged in high intensity disputes.)

I forgot to add, in my notes above, that early today I heard one of the adult ♀ Blacks Scream briefly, without 2nd Hill, when the ♂ ran round into her and knocked her down. So independent Screams do seem to be an adult pattern of the Blacks at least

Ateles ssp. I — October 30, 1960 Barro Colorado

Today, I spent most of my time watching the young Reds.

I think that my account yesterday may not be very clear in one respect. All the semi-tame young Reds, including the ones that are at least 1/3 grown, and the Black Buck-teeth, still don't Spill's, with B2, to me from time to time.

None of the young Reds, however, has done much in the way of Spilling. Presumably because the circumstances haven't been right. Spill's have been so rare, in fact, (and most of them have been so brief) that one would suppose that the Spill's of the youngest Reds are nothing more than intermediates between Squ and Screams. This supposition is obviously misleading.

The rarity of Spill's by young Reds now is probably due to two factors. 1. They are all more or less independent 2. They are none of them very tame. Almost all the behavior of most of the young Reds now is largely & completely hostile. The Squ and Scream are by far the most common of the purely or largely hostile vocalizations of young Reds, and often intergrade with one another during hostile encounters. Some of the notes intermediate between typical Squ and typical Screams during some hostile encounters seem to be Spill's in sound. They probably are Spills in fact — the "first" of the purely or largely hostile Spill patterns.

In other words, the Spill patterns of the young 1/4 to 1/2 grown Reds I am watching now are in process of transition. Some of them are becoming hostile, like the Spills of adults. It is possible that these young Reds are still capable of uttering non-hostile Spills as a "Contact call", like the Spills of young infants (presumably young infant Reds as well as young infant Blacks). Some of the Spills which these young Reds emit low-

and me now may actually be attempts to "summon" me. But these young Reds do not have any real use for a "Lost call" now, at least most of the time.

This morning I heard one young Red, about ⅓ grown, utter definite verses of 3 Notes, 3 or 4 times. Apparently hostile. Possibly directed toward other young Reds or the adult Blacks some distance away. These B's were quite loud and very distinct. Low-pitched but sharp.

---- I should imagine that these verses were "incipient" Ags B. (It is possible that the peculiar "Ord B" of adults is derived from high intensity Ags B. Or, more probably, both the Ags B and "Ord B" of adults are derived from the same "undifferentiated" B of young. The B patterns of one of the first young Blacks I had, L, would seem to be particularly significant in this connection.)

This afternoon the oldest of the young Red ♀'s I have had for a long time (I shall call this animal "Julia" from now on) approached me while I was sitting on the ground, and went through the complete "greeting" patterns of animals of her age (slightly less than ½ grown). She came right up to me, uttering lots and lots of "Snorts" quite like those of the Banter Blacks, described above on November 14 & 15, 1959, pp. 31 and 32. All these Snorts were accompanied by PL, and the PL was maintained between successive Snorts. The mouth was kept quite closed during most Snorts. Only occasionally, opened a very little but as a Snort was uttered, and then closed again immediately.

Continuing PL + Snorts, Julia then started to climb all over me. Occasionally nibbling at part of me, and also licking me from time to time. Then came right up and SNF'd at my face, and then nibbled at my nose, teeth! She also "chewed" by herself, from time to time, in exactly the same way as various infant Spiders and Howlers I have had.

Every once in a while, during this exploration, Julia's Sweeting would develop into brief MfB. The transitions Sweeting → MfB and MfB → Sweeting were unabrupt, smooth and gradual. Her Sweets and MfB's appeared to be little more than two extremes of a single pattern! It seems quite likely, therefore, that the MfB's develop from Sweetings (probably by "contamination" from B patterns) in the course of ontogeny. Both typical Sweets and typical MfB's have the same "faltering" rhythm.

The most extreme MfB's uttered by Julia today were quite like those I heard yesterday (some of which were also uttered by Julia) described above on p. 37 for the MfB of adults, but softer.

Some of Julia's MfB today was accompanied by Lsh's. Most of her MfB's were accompanied by moderate opening and closing of the mouth, but during a few of them, both with and without Lsh's, the mouth was held wide open, in what appeared to be MO or, more probably, BT. None of her MfB's was accompanied by OL.

Sometimes Julia uttered MfB's "on her own". I could not tell what provoked these. But most of her MfB's occurred when I touched her, or grabbed her tail. This would indicate that her MfB's were more hostile than her Sweets. Probably fairly aggressive (as she did not retreat during MfB's, and some MfB's seemed to be accompanied by BT).

Julia also uttered little bursts of rather plaintive Squ's from time to time during this exploration. These Squ's were combined with OL, like the Sweets. But they did not intergrade with Sweets. Most of her Squ's were uttered when she made little incipient retreats (she made a lot of these retreats during her exploration). This would indicate that the Squ's are also more hostile than the Sweets. Probably produced when escape is predominant.

After exploring me for about 5 minutes, Julia gave up and left

me, without further display.

A few minutes later I happened to approach Abdomeno, and noticed that he was behaving in somewhat the same way as Julia. He was hanging on the side of a cage, about 4–5 ft away from me, regarding me intently and uttering lots of hoots, with PL, just like Julia. He continued to do this off and on for at least 10 minutes, moving about considerably, but never coming very close to me. He occasionally uttered hqu Notes instead of hoots. Some of these hqu's were much longer than others. There seemed to be real WW, but they were obviously nothing more than high intensity hqu's and/or intermediate between hqu's and hoowans (see below). These hqu's and "WW"s were also accompanied by PL; and usually, some slight opening or closing of the mouth with each note.

Some of Abdomeno's hqu's and "WW"s were accompanied by retract movements; but not most of them. So the hqu's and WW's are not extreme alarm.

Every once in a while, one of Abdomeno's "WW"s would develop into a real Scream. These were always accompanied by retract. Mouth opened quite widely, but no real MO or BT. No PL. (It was primarily Abdomeno's behavior this evening which convinced me that all or most of the hqu's and "WW"s of young Reds are incipient Screams.)

Abdomeno also uttered a few single B notes — quite indistinct vis-à-vis sound — during this performance. I couldn't really see what provoked these notes, but I presume they were also a hostile reaction to me.

After watching many of the Reds do PL today, I realize that the lips are not usually really puckered during PL. Just protruded. Only Abdomeno really puckered today. But all PL performances, both silent and vocal, are accompanied by the slight chin-lifting and eye-closing

Notes of Red Spider Monkeys on BCI

December 14, 1959. 1 Sub-adult or young adult ♂

December 19, 1959. 1 adult ♂, 1 sub-adult ♀, 1 very young ♂

In mid-February, 1960, the adult ♂, the sub-adult ♀, and the very young ♂ were taken over to Frijoles Inlet. They have not been seen since.

April 1, 1960 1 very young ♀

May 10, 1960 1 sub-adult ♀ (very dark)

The very young ♀ has stayed near the clearing, associating with the sub-adult or young adult ♂. The sub-adult ♀ just flad away into the forest when released, and has not been seen since.

So now, May 11, 1960 we have the following return to:

Band I. Clearing. 1 sub-adult ♂ and 1 very young ♀

Band II. Fuentes Inlet. 1 adult ♂, 1 sub-adult ♀, and 1 very young ♂ (presumably)

"Loose" 1 sub-adult ♀

TOTAL = 3 ♂'s, and 4 ♀'s.

August 14, 1960

There have been a number of additions since May 11

Band I Increased by the addition of another young ♀. This ♀ is even smaller than the other young ♀ (who has now begun to grow appreciably). It has been gradually oriented into the band over a month or so, and now seems to be quite well established.

Band I now includes 1 adult ♂, and 2 young juvenile ♀'s.

Band II. Has not been increased. None of the survivals in this band has been seen since release.

Loose During the week of August 1, 1 adult ♂, 1 adult ♀, and 1 half grown ♂, were released around the clearing, and have gradually drifted off, separately. This loose group now includes 1 adult ♂, 2 adult ♀'s, and 1 half grown ♂.

TOTAL = 5 ♂'s, and 5 ♀'s.

(Adults or sub-adults = 3 ♂'s, and 3 ♀'s.)

September 29, 1960

Band II and the "Loose" individuals have not been seen at all. Presumably unchanged.

Band I has been greatly increased. About a month ago, I added another young juvenile ♀ (an animal with one bad eye) to this band. It has stayed around, and seems to be flourishing, but it is a trifle psychotic, and has never become very closely associated with the other members of the band.

Then today I let loose 6 more animals. 2 ♀'s and 4 ♂'s. One of the new ♀'s is perhaps nearly half grown — a little older and larger than the largest of the juvenile ♀'s who has been with this band for a long time. The remaining new animals range from appx. 1/3 grown to older infants.

All the new animals stayed around with the band all afternoon and evening.

So this band now consists of 1 adult ♂, 5 young ♀'s, and 4 young ♂'s.

TOTAL (no. of animals on island now) = 9 ♂'s, 8 ♀'s.

(No of adults or sub-adults unchanged).

June 6, 1961

Band I (Clearing). All the young ♂'s of this band have died or disappeared since the last notes written above. This band now includes 1 adult ♂ + 5 juvenile ♀'s.

Band II (Fuertes House). This band is unchanged. It should include 1 adult ♂, 1 adult ♀, and 1 juvenile ♂.

Two of these animals were seen in late April, 1961 (Zimmermann).

"Loose" Known to be loose are 1 adult ♂, 2 adult ♀'s, and 1 juvenile ♂

TOTAL = 5 ♂'s (3 adult)
8 ♀'s (3 adult)

January 14, 1966

There has been very little obvious change in these animals - until recently.

None of the Band II or "Loose" individuals has been seen since 1961.

The "psychotic" ♀ in Band I was removed, in late 1961 or early 1962, and let loose on the far side of the island. She has not been seen since.

The four remaining ♀'s with Band I have been

adult for (at least) a year now.

At least three, and possibly four, of these females became obviously pregnant in late 1965.

One of these ♀'s has given birth! Baby first seen on January 2, 1966. Still being carried and cared for by mother. (Baby clinging to breast). Another ♀ may have lost a baby a few weeks ago. A third ♀ still looks very pregnant.

The single ♂ is still associating with these ♀'s in this band. He looks very battered (missing a lot of teeth, and with one bad eye), but must be healthy in most important respect.

On January 6, 1966, I let loose three new animals, 2 sub-adult ♀'s and 1 young (slightly less than half grown) ♂. Let loose together on Barbour point. I shall call this "Band III".