

5-17-1991

## Bolivia 1991 Field Notes

Mariel Campbell

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1991

Bolivia

Journal

17 May

Arrived in Santa Cruz this morning after roughly 24 hours of travel from Albuquerque. With me are Nella Sanchez Cook and Jorge Salazar Bravo. We are meeting up with the rest of this year's Bolivia expedition, Joe Cook, Jon Dunnun, Jim ~~White~~, <sup>Wood</sup> Frosty Davis, and numerous Bolivian students in Santa Cruz.

I will be here the full three months, returning in August, but Joe + Nella will be leaving after this first 4 wk trip to Cochabamba + vicinity. On June 24, Scott Gardner, Terry Yates, and Sydney Anderson will be joining us for the second trip to Tarija. Our goal this summer is to census small mammals along an altitudinal gradient at various latitudes (Cochabamba + Tarija). Eduardo Palma will also be joining us later in the summer.

Our luggage, along with the luggage of roughly half the people on our flight, was left mysteriously in Miami, so our first hour or so was spent waiting in large clumps of people to talk to various officials who invariably were not the person you needed to see anyway. Rumor has it our bags will arrive tomorrow.

Joe et. al have spent a frustrating but nevertheless enjoyable week here

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trying to sort out permits, personal + international relations, and car deals. Still no vehicle, though Joe is close to buying one if he can figure out how to satisfy the University of California at Davis bureaucracy. Scott Gardner of UCD will be buying at least part of the vehicle through his NSF money (in absentia).

Since the crew is still unable to leave on our Cochabamba trip, Joe has arranged for us to trap tomorrow night in San Ramon, ~ 4 hrs N of Santa Cruz.

We will stay 1 night + bring the animals back to our residence in SC for prepping, here at the Parque Zoologica. Otto Carlos Jordan, director of the zoo, is letting us stay here in some old office + lab space above the main office, and all of our gear is stored on the premises.

Frosty, Jon + Jim leave tomorrow at 6:30 a.m. with Bolivian students Emma (parasitology), Erica (?) and Jose Carlos Maria Dolores. Joe, Nella, Jorge + I will meet them in San Ramon after we resolve on luggage.

We set up bat nets in the zoo tonight. There is a palm tree by the entrance with a parasitic fig tree (*Ficus bibosi*) growing from it. There

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As are numerous small green figs which attract large Artibeus. The bats dart in and out of the foliage on this particular tree. We caught several, 2 Artibeus and 2 Uroderma = Vampyrops?  
Joe also set a net up inside the zoo across the main path under trees, catching the same two species. Apparently previously they have caught Glossophaga by the aviary near some large, tubular white-flowered vines, but a net in a similar location tonight yielded nothing.

Dinner at Bella Napoli & to bed.  
Night cool & humid.

18 May

I woke late, ~6:30 A.M. time, and missed the departure of Frosty, Jon & Jim to San Ramon. We picked up our bags today at the airport. Nella's bag did not have a lock, and the radio & batteries she bought for our field crew had been stolen. It seems it was to someone's advantage to have our luggage delayed for a day.

We prepped bats in late morning. On closer inspection, the Uroderma appear to be Vampyrops, according to Jorge, because they have a fringe of hair on the uropatagium, as well as a full racing stripe down the back.

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San Ramon

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There also may be 2 spp. of *Artibeus*, both large.

Joe bought a truck this morning, a large diesel similar to the zoo truck of previous years. He has to have a bed installed with high sides before we can take it to the field.

At 3:00 Marcello's wife met us & took us to the bus station for the ~5 hr. ride to San Ramon. The bus fare is ~10¢ for this trip. Not bad. Cheaper than eating. However, the ride seemed interminable.

We travelled through a patchy landscape of cut over forest + agricultural fields, lush even now in the dry season. Tall stands of cane + grasses line the ditches along the road. The area is fairly well populated, but scattered patches of forest still remain.

Marcello Zalles met us in San Ramon.

He is in charge of conducting a faunal survey of a future gold strip mine in the mountains ~ 2 km N + 10 km E San Ramon

~74 km  
by rd

by rd. The mine is being developed by Nike Bennett, a geologist who discovered the gold. He has been very receptive to the idea of getting biological data on the site before it is developed. This, of course, is all what we have been able to piece together since arriving. Bennett has arranged a \$20,000 fund for Marcello & the Museum of Nat. Hist. in Santa Cruz.



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San Ramón

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5

(  
4 transect  
120 traps  
5m/apart  
Cerro  
Pejichi  
600m  
to conduct this faunal survey. They  
have been here once a month for  
4 months. They already have noticed a  
decrease in abundance of rodents since  
road construction began, but they have  
been censusing different transects at  
progressively higher elevations.

The forest at this site is beautiful.

105

~~85~~ mammiferous

After turning off the main road we  
followed a dirt track towards Estancia  
Castedo, their ~~base~~ primary work area/camp.  
16° ~~32~~ 35<sup>S</sup> 62° 25' W.

(  
Cercropia  
canopy

2° growth

20-40 years  
old

There is high canopy, with significant, almost  
impenetrable understory. The road was full  
of nightjars. I wish I knew my plants.  
This I suppose would be classified as  
bosque humedo montano. I will be able  
to see more in the morning.

The camp is near a man-made pond  
from which frogs are calling. I'm  
kicking myself for not bringing my  
recording equipment & some kind of net.  
There are at least 2 diff. frogs calling.  
I saw a small cricket-frog like  
species as well as a large, gold colored  
Hyla (~2½ in body length) next to  
the water. On checking bat nets I  
also saw a Bothrops coiled at the water's  
edge, perhaps hunting frogs.

105 mammals caught to date

7

Copy of Marcellos' species list:

Monodelphis domestica	Sylvilagus brasiliensis
Didelphis marsupialis	Cerdocyon thous
Rattus rattus	Sciurus ignitus?
Oecomys trinitatus	Atles sp.
Oecomys mamorae	Cebus sp.
Oryzomys chacoensis	Saimiri sp.
Akodon varius	Alouatta sp.
Oligoryzomys chacoensis	Prodonates maximus
Calomys sp.	Galea sp.
Oxymycteris	
Pseudooryzomys	
Proechimys	
Carollia perspicillata	
Artibeus lituratus	
Glossophaga soricina	
Sturnira erythronos	
Sturnira lilium	
Sturnira sp.	
Sturnira oporofilmum	
Uroderma bilobatum	
Potos flavus	

Auellas

Tapirus terrestris	Tamandua tetradactyla
Mazama americana	Dicotyles
Mazama gouazoubira	Fayassu tejaqui = collared pécary
Agouti paca	Dasypus sp.
Dasyprocta sp.	Ctenomys
Felis concolor	
Tolypeutes tricinatus	
Procyon <del>ex</del> cancrivorus	



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Frosty et al have set out traps + bat nets. Total out:

Jim + Frosty 40 Shermans

Jon + Jose Luis 70 "

(110) total

Agouti  
Muzama tracks

+ 4 30' bat nets

bait: oatmeal sardines

As of 11:00 pm: bat net results

2 Artibeus + 1 Artibeus 12:00

2 Carollia 1 Glossophaga

1 Sturnira 1 Carollia

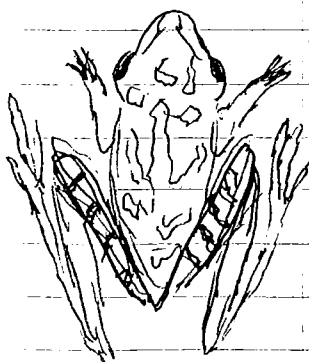
Clear + very humid tonight. Moon at 1/4 waning to half.

A midnight frog search yielded numerous species, for very little ~~easy~~ effort, basically just by walking with 100' of camp. Two large species, the gold Hyla and another greenish Hyla on a <sup>felled</sup> palm frond by camp, escaped or were let go inadvertently.

There are many small terrestrial spp, one black with yellow lateral stripes, orange patches on thigh + shin + pectoral/axillary.

Belly blotched white/gray. Another is colored like a brown dead leaf. He did catch a Hyla in a small Cercoptera, ~ 1 1/2 in. long, brownish.

⊖ eye gold with black pupil



brown gold with brown blotches

inner thigh purple gray with dark blotches  
belly white

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5/19 a.m.

Atlixes  
hummingbird  
Kazama tracks, scat

Galea? on transect  
by rd a.m.  
small dark scurrying  
form  
Oryzomys?

Frosty + Jim's transect trap results:

40 traps:

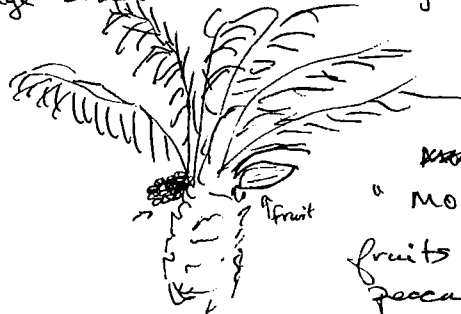
Trap 6 Akodou sp.  
(B69) hillside with trampled tall cows  
grass, open, no canopy  
above stream 25'  
secondary growth cover 50%  
at 3 meters max

Trap 34  
B-60

Akodou  
same habitat,  
Cecropia, forbs, grasses  
fallen logs, palms in stream bed below

green Colebrid snake across trail  
yellow/white dorsal stripe  
moves like coachwhip  
~ 3 1/2 ft

Large-based Palms with rough trunks, not found  
in forests of cordillera



~~nutcrack~~  
"nutcrack"  
fruits eaten by Tayassu  
peccaries

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5/19

An Artibeus in net one this morning. The peak activity last night occurred between midnight and 2:30. A new genus picked up later in evening: Pygoderma.

Total bat count:

Carollia	tttt	5
Glossophaga	llll	4
Artibeus	tttt ll	7
Sturnira	l	1
<u>Pygoderma</u>	lll	3
5 spp.		20 bats

Hummingbird in bat net ~ 7:30 a.m.: Anthracothorax nigricollis = Mauge comin.

Clear + wet this morning. Heavy dew.

Mosquitoes annoying but not terrible.

Butterflies everywhere

I checked Jim + Frosty's line with Jim + Jorge.

Trap results opposite page.

blue/black swallowtails

The camp is in a little valley, in essentially flood plain, with fairly open understory because of the wet soils. Up the SE facing slope by camp the upland slope vegetation is dense with substantial understory at all levels. The soil, which everywhere is reddish + clay-ish, is drier upslope. It looked like good habitat for setting traps, with fallen, vine covered branches + shrubs thick on the ground + lower canopy. The low flood plain is perhaps too wet for burrows. I saw numerous

(11)

birds sighted or in nets at San Ramon:

Anthracothorax nigricollis Mangó común

Phaethornis sp.

Leucopternis sp.  $\left\{ \begin{array}{l} \text{lacernulata} \\ \text{or} \\ \text{albicollis} \end{array} \right.$   
✓ - mostly grey above

Dendrocolaptidae

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Joe and Marcello went to look for tree mounds + pick up the N<sub>2</sub> tank in the morning.

The rest of us stayed around camp + took photos.

Later when Marcello returned we all drove up to the top of Carro Pejichi, from alt. 600m, from which we could see San Ramon to the south + west.

In the distance stretches lowland forest - with only an occasional visible clearing.

The forest to the south of these mounds is primarily chacoan; to the north, Amazonian.

Returned + picked up camp, taking animals with us. Caught 3:00 + bus for 5 hr ride back to Santa Cruz.

5/20

Prepped animals late last night. To bed ~ 12:00. Today we skinned + prepped parasites, and got ready to go to the field. We're leaving even if we have to take the bus.

Emma showed up in the afternoon + helped with parasites. We stayed till late packing then went to dinner in town. I tried to call Chris at the Intel phone company, a procedure which required a 1/2 wait for an operator, with no luck. Phone rates are \$30 for 12 minutes to the states.

(13)

5/21 Trip Members to Cochabamba:

Joe Cook

Nella Sanchez Cook

Jon Dunnum

Jim Wood

Forrest Davis

Marcello ~~Stake~~ Zalles

Leonardo Maffei Fagale

Erika Cuellar ~~Soto~~ Soto

Jose Carlos Herrera

Mariel Campbell

Jorge Salazar

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5/21

Today we pack up and leave for the field. Joe has rented a "micro" bus for us to take us to a farm owned by a friend of Marcello's on the way to Cochabamba.

The truck is finally ours this morning, but we'll have to get a bed made for it before we can use it.

On the road this afternoon by ~~3~~ 4:00. All of our boxes would not fit on the micro, so we left Joe trying to tie them onto the bed-less truck.

The trip to the west was beautiful. We entered the foothills fairly quickly, passing small towns nestled into dense green vegetation in the hills. However, Jon somehow lost ~~2~~ \$250 in cash either on the bus or earlier, as we found his passport on the floor missing the money tucked inside.

~~Kms~~

Km 103

Our destination was the farm of la Quinta de Manfred o, an organic farm on the route to west. However, we arrived after dark, unloaded ~~at~~ our mountain of gear by the side of the road, and discovered that there was no way to cross the river except by footbridge. Marcello had noticed a station of the Bolivian forest service 2 km down the road, so we walked down + asked if we

(15)

1 km NE Estancia Cuevas  
18° 11' S 63° 44' W

3 km E Samaipata  
18° 10' S  
63° 49' W



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( ) could stay there. ~~They agreed~~ <sup>The caretaker</sup> agreed, since Marcello's listing of all the government agencies we were affiliated with was so impressive.

( ) The station, ~~is~~ <sup>is</sup> ~~called~~ <sup>is</sup> Vivero Forestal, km 101 is a nursery ~~where~~ <sup>of</sup> the Bolivian forestry service, Ministerio de Asuntos Campesinos y Agropecuarias (MACA). They grow eucalyptus + pines for reforestation projects in the area. There are 3 buildings and a thatched ~~at~~ work area on ~~the~~ immaculately maintained <sup>tidy</sup> grounds. The buildings are unoccupied except for the caretaker, Gregorio Rivera, ~~and~~ and appear to be used as laboratory space on occasion. The caretaker ~~is~~ is under the supervision ~~of~~ <sup>by</sup> Ing. Santiestevan of MACA in Santa Cruz. This is an excellent place ~~to~~ <sup>to</sup> work out of because they maintain ~~of~~ <sup>of</sup> a weather station. (data on opp. page)

( ) Joe arrived at ~ 12:30 a.m., loaded down with our 14 boxes which he'd had to have lashed to a specially made wooden rack before he could come out here. We felt like Dorothy arriving back in Kansas to get off the side of the road and into ~~the~~ our forestry camp.

( ) While we were waiting on the road shoulder we set out Sherman traps. Trappers are as follows:

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Locality:

1 km NE Estancia Cuevas 18° 11' S 63° 44' W

Vivero Foresta Cuevas

1300 meters

average temp  $\approx 15^{\circ}\text{C}$

maximum  $30^{\circ}\text{C}$

minimum  $0.1^{\circ}\text{C}$

ppt ~~for~~ ('90) 775 mm

"Neacomys" - reddish dorsally  
long tail = oryzomyine  
white belly

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Jose Carlos 40

along river

Erika y ~~heo~~ 40

sugar cane field / slope

Marcello 40

" "

Frosty / Jon 38

secondary growth / S. slope

158 traps

Traps were set to either side of the road, some along the river + others up the N-facing slope in sugar cane field + border and in dense secondary growth. Human habitation close by. The moon was extremely bright till ~ 11:00 pm, when cloud cover closed in. Moonset ~ midnight. Bait with oatmeal.

22 May

Rain last night and this morning.

Our camp here is wonderfully comfortable.

All tents except the large one are set up under the thatched roof of the work shed.

Trap check this morning was disappointing:

3 animals:

Jose Carlos: 1 Rattus

Frosty / Jon: 1 Oryzomys

1 Neacomys ?

3 of 158 traps

~2%

158 <sup>1</sup>/<sub>300</sub>  
158  
-----  
7420

Afternoon spent scouting, holding staff meetings etc. Joe has divided us into two groups, one responsible for bat netting + the other for Sherman trapping.

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Catalog

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Bat group:

Jon Dunn, Jim Wood, Marcello Zalle:

Sherman Traps:

Mariel Campbell, Jorge Salazar, Frosty  
Davis, Leonardo Fagale, Erika Soto  
Nella Sanchez

Underline = ~~individual~~ responsible for organizing.

We decided that our rodent trapping  
should be standardized as follows:

- ① traps set 10 paces apart
- ② " " 2 per station
- ③ " flagged every 5 stations
- ④ bait with mix of oatmeal, sardines,  
vanilla + possibly banana.
- ⑤ ~~traps~~ At least 3 lines of 40  
each per microhabitat, with  
effort made to sample all habitats  
in vicinity

We have available to us

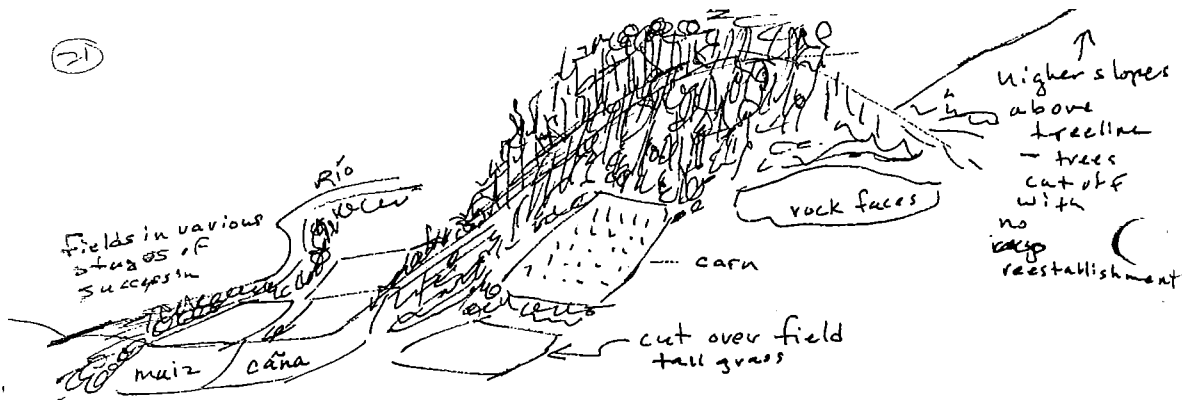
429 Shermans

= 8 boxes of 40 + 29

plus Tomahawk traps

Macabee gopher traps

bat nets



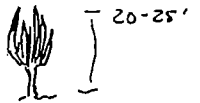
Characteristics of Bosque Here:

xerophytic elements: Acacia

Opuntia

cactus trees

bromeliads



Tillandsia : epiphytes

trees = Malvaceae? dom. family

Introduced:

Eucalyptus

Pinus

Cupressus



plantations have been established on barren slopes

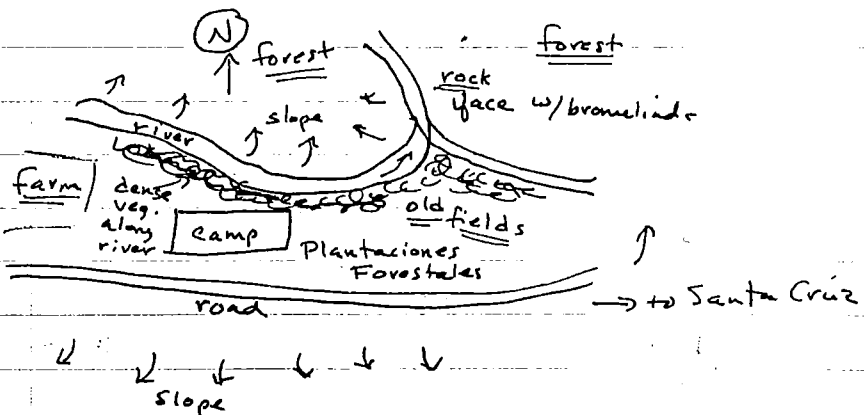
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In the afternoon Jon, Jim, Marcello and I set several bat nets over the river. This is a rocky, fairly calm river no deeper than a foot or two at most. To either side are densely vegetated slopes which rise steeply, although here by camp there is a stretch of flat flood plain before the slope to the south.



3 Km E  
Samaipata

Joe, Jose Carlos, Frosty, Jorge + I went up the road scouting for good trapping sites. The forest looks beautiful from the road, but when you enter it you can't go far before finding some sign of human disturbance, e.g. a hidden house, an old clearing, a petroleum camp. Jose Carlos + I set 40 traps a piece up a stream bed on the N-facing slope. The first 100' looked good, with high canopy, many vines + shrubs, good ground cover of fallen logs, rocks, dead leaves + bromeliads, but it ended abruptly at

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a clearing below a petroleum site. The clearing was still heavily overgrown with good cover. No people in sight. While ~~was~~ we were setting the others went in search of more sites, with no luck. Too much disturbance. We decided to set traps around camp because the forest was just as good there.

Traps out:

	Maribel + Jose Carlos:	78	3 km E Samaipa
along river	Erika + Leonardo	22	1 km NE Est. Cuev
up slope	Frosty/Marcello	50	"
along river	Joe + Nella	60	"
up slope	Jose Carlos	40	"
along river	Jorge Salazar	38	"
in pasture/ <sup>along</sup> river	Maribel	39	"

325 traps

Jon et al set a total of 78 bat nets, of which 4 were set over water on the rivers, and 3 were set along trails to the rim from pasture + secondary growth. First bats caught ~ 7:30 pm. Last check/closed ~ 12:00 am

Sturnira cf. oporophilum    +++++

Desmodus    1

Carollia ? Sturnira    1

Myotis    11

4 spp.    13 total  
(14 - 1 escapee)

All details are to be found in the bat ecological data sheets maintained by Jon Dunnum.

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23 May

Clear this morning, high mist early. Up late last night prapping. Three bat nets were stolen this morning by a neighboring child; Marcello got <sup>2 of</sup> them back + promised Spesos for the third. Many of the traps set by camp had been knocked about last night.

Trap results 23 May:

	Marcel	<u>Rattus</u>	1	3 km E Samaipata
along river forest/sec. growth	Joe/Nella	<u>Oryzomys</u>	1	1 km NE Est. Cueva
"		<u>Akodon</u>	1	"
"		<u>Oecomys?</u>	1	"
along river	Jorge	<u>Oryzomys nitidus</u>	11	"
	Erika/Leo	<u>Oryzomys</u>	"	1
	Marcel	<u>Akodon</u>	1	
8 of 325		4 spp		8 total
				2.5% success

The "Oecomys" caught by Joe + Nella is an interesting creature. It is greyish brown, longish fur, very long scaly ~~to~~ naked tail, fur inside surface of ears, ears shorter than Rattus. It was caught in the secondary growth, low canopy of underbrush along river, near pasture.

I was surprised to catch a Rattus in the traps along the stream up the road. It was at least 100 yds from old buildings, but in the dense forest. We pulled those traps.

Most of our captures were along the river vs. up slope.



23 May  
Cuevas

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Joe + Nella returned to town this afternoon (Santa Cruz) + will return tomorrow with supplies + hopefully a truck bed.

Jon et al moved bait nets + reset them, 5 total tonight.

Trap lines as follows:

Lines left set from last night:

sec growth	Maribel	<del>40</del> <sup>40</sup>	in pasture by camp
forest/sec. growth	Joe/Nella	60	along river/pasture
forest	Frosty	50	up slope
"	Jose Carlos	40	" "

plus new lines:

forest	Jose Carlos/Jorge	110	up slope (N)
forest	Frosty/Leonardo	40	" "
secondary growth	Erika	25	" " across road (S)
"	Maribel	20	along river pasture edge

total = 385 traps

+ 5 Tomahawks

set by Frosty, Jorge baited w/ tuna sardines

The lines set by JC/Jorge + Frosty/Leo are in same habitat on slope on N side of river.

The 20 traps I set in pasture are near Joe/Nella's line of last night.

Soccer game in evening - Jon + Jorge lost to local kids. To bed late after prepping bats till midnight

(A)

Screed Owl in nets evening of May 23  
Marcello collected it for the museum

Marie! Trap results for 24 May:

line of 20 <sup>along</sup> in pasture (set by JAC, NSC) (picked up line)

Trap 504

? long tail; large; scruffy brown

on edge of pasture in dense border of forbs, shrubs & small trees.

line of 20 along pasture (set by me)

- nothing

line of JAC/NSC along river:

This is a beautiful section of broad leaved small trees forming a high, closed canopy, with intricate understory of vines, forbs, shrubs, forest floor of dead leaves, fallen logs, much routed about in places by pigs. It is open enough to walk through fairly easily along a trail. The dominant trees resemble a rubber tree and a ~~leaves~~ Cecropia with spiny trunk.

B-138 Marmosa

on ground in forbs ~ 20' from river.

Thick overhang of ~~pruned~~ matted vines above in vicinity.

line of 40 along pasture (set by me)

small thrush in Trap 34

bait eaten by chickens

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24 May Misty, cool in a.m. It will be a hot clear day.

Bats last night: two new species, a large Lonchophylla = Glossophaga-like Phyllostomid and a darkish Carollia brown Vampyrops-like species.

It appears there may be 2 species of Sturnira, a charcoal grey sp. and a lighter orange brown spp., probably oporaphilum and liliium.

My trap lines are described opposite page.

Total trap results:

edge of pasture, forest	Maribel	Oryzomys? subflavus?	1
along river, forest	"	<del>Har</del> Gracilinanus	1
N-facing slope, sec. growth	Erika	Neacomys	1
S-facing slope, sec. growth	Jorge/Jose Carlos	"	2
			<u>6</u>

$$\begin{array}{r}
 385 \overline{) 6.00} \\
 \underline{385} \\
 21.50 \\
 \underline{19.25} \\
 1.25
 \end{array}$$

[6 animals] of 385 traps  
[~ 1.5%] success

one set off → Nothing in Tomhawk traps. Nothing in the but empty. 110 + 40 = 150 new traps set by Frosty, Jorge & Jose Carlos on the slope N of the river. Perhaps the disturbance discourages rodents. We'll leave them another night.

I pulled Joe & Nella's line of 20 along the soccer field because many of the traps had been picked up and moved about. The Oryzomys subflavus / Neacomys / ?? was caught along this line, and appears to

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be a larger version of our unknown from yesterday, Rattus sized,

Our trap success has been minimal. Fortunately we've had good success with the bat nets to give us something to do.

Spent the day taking showers, washing clothes, hiking + taking pictures. It was a glorious day, + hot.

Total bats:

*Sturnira*    IIII

*Carollia*    1

*Lonchophylla*    1

*Myotis*    1

9    4 spp. +

In the afternoon we set out the rest of the traps. Frosty pulled his line of 50 from last night, so we had 120 to set out. Leonardo + José set 80' up the N-facing slope to across the road to the South, and Erika added ~20 to her line of yesterday on the same slope. I took 40 + reset 20 of them on Joe + Nella's line by the soccer pasture, but this time I put the traps inside the small strip of forest between field + road, rather than on the edge. I set the other 20 in a similar habitat along a road clearing/sec. growth/dense shrubs + forbs near my line of 40 in the burro pasture. Jorge set 24 snap traps in the forest across the river, with

(33)

21-25 May Total Species For 1 km NE Cuevas  
18°11'S 63°44'W

Oryzomys nitidus

Neacomys

Rhipidomys

Oecomys?

Gracilinanus sp.

Microzeus cinereus

Rattus rattus

Akodon

Sturnira lilium

Sturnira sp.

Desmodus rotundus

Anoura

Lonchophylla

Myotis

Carollia

Sylvilagus brasiliensis

24 May

M.L. Campbell

Bolivia

Cuevas

Journal

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traps placed up in the trees. Bait with oatmeal, banana, tuna, vanilla.

Traps out:

	Maribel	40	along pasture/sec. growth	
	"	20	pasture/soccer field/forest	
	"	20	along pasture/forest	
	(Joe/Nella)	40	along river/forest	
Jose Carlos Erika Leonardo	} 100+traps	Frosty	40	S-facing slope/forest
		Jose Carlos	<del>40</del> 100	N-facing slope/sec. growth
		Erika		N-facing slope/sec. growth
	Jose Carlos/Leo	<del>60</del>	N-facing slope/sec. growth	
	Jose Carlos	40	S-facing slope/forest/sec. growth	
	Jose Carlos/Jorge	110	" /forest	
	Jorge	24	snare traps/forest	

[434] traps

Marcello, Jon + Jim & reset the 5 bat nets.

As of 1:30 a.m., net results as follows:

Lonchophylla 1  
 Anoura 1  
 (2)

= Two additional nectar feeders, caught along path from pasture to river.

Joe, Nella, and Emma (Bolivian student) arrived at 9:30pm while we were prepping animals. Apparently we leave tomorrow for our next site higher up, taking the animals with us in the morning.

(35)

Trap results: 25 May

Jae + Nella's line of 40 in forest along river:

B-140 Oryzomys Trap 40 pair dense shrubs, leaf litter, vines, ground cover along trail in small clearing; willow canopy at 30'; cover 40%; ground/shrub cover 90%

JAC, MSC, MUC 75% of trap line disturbed by pigs  
My line of 20 in forest along river ~~but~~ behind soccer field

649 Oryzomys leaf litter, vines, forbs, shrubs, 15' canopy with 80% cover cover at ground level = 75%.

Both traps of pair

This line also disturbed.

629 Oryzomys same 2 traps missing.

My line of 40 at border of pasture by river:

Half of traps disturbed / knocked closed.  
No animals

My line of 20 along path toward river

B-56 Oryzomys dense undergrowth of forbs, grass, vines + shrubs along cleared path. No canopy. Cover 95%.

24-25 May

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Total Bat species this locality:

Sturnira (2 spp) 16

Glossophaga <sup>lilium</sup> ~~sonoriensis~~ sonoriensis -

Carollia sp. 1

Lonchophylla sp. 2

Anoura sp. 1

Myotis (2 spp?) 3  
<sub>m. nigricans  
m. oxyotus</sub>

Desmodus rotundus 1

24 bats

= <sup>6</sup> ~~7~~ genera, possibly <sup>8</sup> ~~7~~ species

It is interesting to have ~~the~~ two major nectar + pollen feeding bats here, Lonchophylla and Anoura. There are some ~~and~~ pink + yellow vines blooming, possibly their food source.

To bed ~ 2:30 a.m. after evening of checking nets, drinking rum, writing field notes, drinking rum, and Jorge drinking out of a boot. Yet another evening.

25 May

Chilly last night, with heavy dew. Clear, Moon at 3/4. Clear in a.m.

Picked up all traps this morning. We leave today for our next site as soon as we pack up.

My trap results are on opposite page. Total trap results are as follows:



(39)

Santa Cruz Dept.; 6 km NE Quiñe, 18° 02' S, 64° 19' W  
elevation 1975 m.

25-26 May

First night

Erika/Leonardo ~~80~~ 78 (78 = 2 broken)

Jorge/Mariel ~~100~~ <sup>56</sup> (50 + 80) (E)

JR/Frosty/Emma 120 (to SE) <sup>40 supports</sup> (40 + 30 + 10 + 40)

Jose Carlos 80 (40 along edge of corn field  
40 along dry riverbed)

Joe/Jim

38

~~452~~ set

1452

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24-25 MayMarciel 4 Oryzomys

Leo/JC/Erilka 1 ?

JSB/JC 1 Micoureus cinereus2 Akodon Clescaeei2 Neacomys1 Oryzomys

$$\boxed{10} \text{ animals of } \boxed{434} \text{ traps}$$

$$= \boxed{2.3 \%}$$

In addition, we have the two bats from last night, Anoura + Lonchophylla, both nectar and pollen feeders.

Frosty caught a Sylvilagus brasiliensis in a Hawaheart trap by the river.

The marsupial is definitely a different creature than the Gracilinanus of yesterday. It is larger, with orange/yellow underparts, and has fur for ~2cm along the base of the tail. Interesting to have both Marmosa-like genera in same locality. I would like to know microhabitat differences.

We were on the road by 11:45 am. See back of this page for road log. We drove up through beautiful forest on steep slopes, with waterfalls and rock faces interrupting the green. By the time we reached Samaipata, however, the terrain levelled out, and was fairly heavily cultivated. It was also drier, and continued to be more + more dry as we

39

Benedicto Padilla  
Jahue  
@ Guido Cullar

<u>25 May 1991</u>		<u>Km</u>	<u>on truck</u>
La Cueva	left 11:45 a.m.	888.9	
Achira	12:00	899.1	
La Cumbre		906	
Samaipata	12:00	908	1700
Cumbre		913.9	1900
Mairana	12:45	924	1450
Agua Clara		951.4	1350
Los Negros		959.4	1350
Pampa Grande		963.2	1400
Mataral		975.6	1500
Quiñe		995	2050
San Pedro		1006	1950

Map of region:

Vallegrande  
Edición 1 - I.G.M.  
SE 20-10  
Serie H531

América del Sur Bolivia 1:250,000

Mercator

Instituto Geográfico Militar (IGM)

La Paz Bolivia (IAGS)

elevations at 100m

25 May

M.L. Campbell

Bolivia

Road to Comarapa

Journal

1971

headed west. Past Samaipata we headed through beautiful canyons following the river valley, but the forest had changed to a more sparse, thorn scrub-vegetation dominated by leguminosae. The tree cacti (*Cereus*?) became more & more dominant. We past several nice rock ridges / outcrops which would be interesting to trap. By the time we reached Agua Clara we were definitely out of the Yungas habitat and into "bosque montano seco", dry thorn upland thorn ~~scrub~~ forest. I love this kind of country, with dry slopes covered with cacti & legume trees, and wet riparian forests filled with parrots.

In Samaipata we picked up an old man & his wife to take to the vicinity of San Pedro. His name was Benedicto Padilla, and he lives <sup>near</sup> there. When we reached Quiñes we decided to turn off the highway toward San Pedro to find a camp. We headed north along a winding dirt road, arriving around 4:00. We didn't get a camp set up for at least another hour, which we spent stopping & asking for anyone who had a spare room in which we could set up our laboratory. We finally camped in the front yard of a little farm at the base of foothills to east, at ~~6~~ 6 Km NE Quiñes, Estancia Jahue (south of). ~~etc~~ owned by Guido ~~del~~ Cuellar.

(4)


Found skull of fox? over top of hill  
in trees, grass, along trap line. (+ mandible)



Trap results 25-26 May

Line of 40 through Acacia thicket:

Trap # 73 Marmosa along  
semi-trail through Acacia  
under lower med sized Prosopis  
columnar cacti in vicinity.  
Ground cover of Corbs (Salvia?  
Senecio?)  
& low shrubs = 40%. Cover at  
canopy of 7ft = 80%.  
oatmeal, sandine, vanilla bait.

Acacia thicket species:

Similar =  
virt. no leaves  
dark green  
stem; thick  
tree like trunk  
pointed, sharp  
stems  
  
Prosopis?

dense Acacia, scattered Prosopis  
→ Bulnesia retama trees; 2+ spp  
of columnar cacti  +   
abundant. Fairly good ground cover,  
occasional fallen cacti & old logs.  
A few larger trees (?), Ximenesia  
americana bushes on hill.

Along Wash proceeding up NW facing slope.

In foothills above cultivated valley  
surrounded by low mtns. Elev. ~2000m.

Chaco influence in vegetation - I see  
many spp. of plants I recognize  
from ~~the~~ Cuyo region of Argentina.

East slope line of 40

More humid; open forest; tall trees <sup>covered</sup> w/ epiphytes  
(Leguminosae); forb & shrub cover at 3-4' = 20%. Becoming  
more dense downslope towards dry streambed. Trees at 20-30'

M-L. Campbell

Bolivia

Quine

Journal

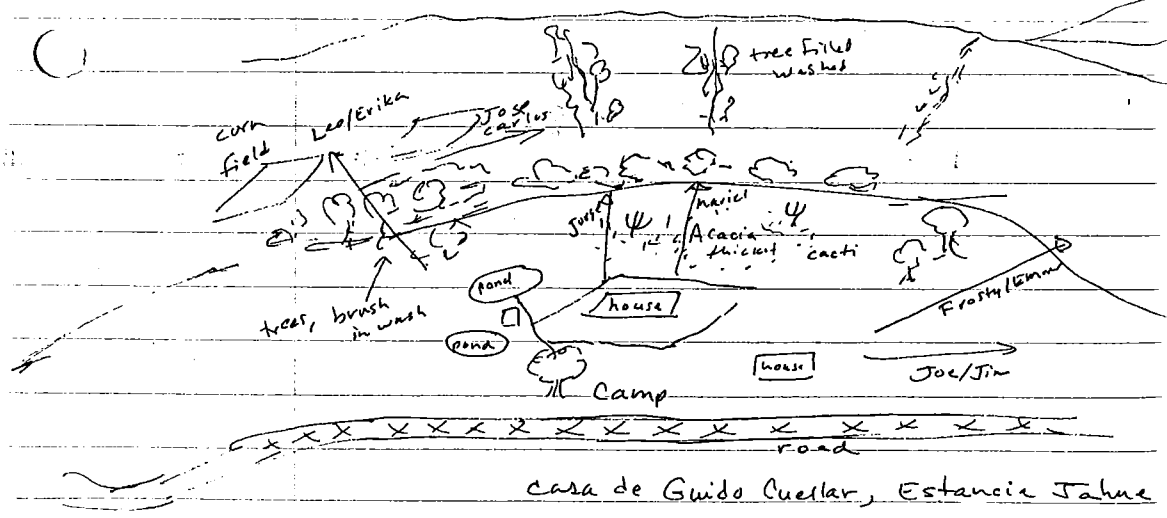
1991

We set traps as soon as we arrived.

Jorge + I set two parallel lines ~ 100' apart behind the house through an Acacia thicket and then up + over the east side into an open stand of trees. Description of line on opposite page.

Frosty + Emma set 120 traps total over the hill to the south; Leonardo + Erika set 78 to the NE in thicket brush along a wash; Jose Carlos 80 traps near them along stream + corn field.

See page 37 for total traps out.



Prepped animals from La Cueva till ~ 2:00 a.m.  
Clear with heavy dew.

26 May

Poor trap success this morning, but high quality. Two little Marmosa, one on my line + the other on Jose Carlos's line.

Traps out 26-27 May

Jose Carlos/Marcello	80	
Joe/Emma/Nella	78	+ 8 Tomahawks
Erika/Frosty	<del>78</del> 39	+ 7 Tomahawks (bananas)
Leo/Jorge	78	
Maricela/Jim	54	

Captures 27 May

Myline with Jim:

~ 35 traps set up along rock ridge  
cut over for wood/goats

~ 25 traps set along quebrada

trees with  
many smooth, pale  
trunks +  
fine dark green  
leaves

(dry) in dense brush; 15' canopy

low understory of forbs at ground  
level; lichens, moss in trees

cover at canopy = 60%

cover at ground = 80%

occasional rock outcrops, boulders

No captures

26 May  
Quine

M.L. Campbell

Journal

(44)  
Bolivia  
1991

They are ~~was~~ smaller than any Marmosa  
I've seen, smaller even than M. pusilla.  
One was caught in an Acacia thicket &  
the other along a wash.

Took the afternoon off to relax,  
catch up on notes, sleep etc. Joe, Nella,  
Marcello, Jim, Jorge and I walked down  
the road to a house we'd passed yesterday  
that had a collared peccary skin hanging  
on the porch (Dicotyles tejacu). This is  
the house of the "corregidor" of Estancia Tahu,  
~~sub~~ (something like the town mayor), Adalid Trujillo.  
We talked to him for a while, telling him  
what we were doing & where we were staying.  
He was very helpful, saying he would let everyone  
know not to bother our traps. He also told us  
about the larger animals here, mentioning the following  
as being present:

"Tatu" Dasypus

"quirquinchu" Chaetophractus

"Tapeti" Sylvilagus brasiliensis

"urina" Mazama americana

"jochi" Dasypsecta punctata  
~~was~~

+ Felis weidii

Felis jaguarondi jaguarondi

Felis concolor puma

Tayassu tejacu collared peccary  
" + peccari white lipped peccary



26 May

M.L. Campbell

Bolivia

1991

Quine

Journal

46

We asked about the possibility of getting skins and skulls of animals people have hunted in the pueblo, such as the peccary skin of his. He said he will pass the word, and that a man up the road may have a deer ~~to~~ (Mazama) by tomorrow.

Joe bought the skull of the peccary (Tayassu) from Sr. Trujillo for 5 Bolivianos, which Jorge says is generous. Hopefully will get more tomorrow.

We pulled all trap lines except 40 of Jorge's traps in the Acacia, 40 of Frosty's on the east slope/forest of the hill behind the house, and 80 of Jose Carlos.

We went to set the remaining traps up the road.

	Jose Carlos / Marcello:	80 traps @ 5 km NE Quine
	Mariel / Jim	54 traps @ 3 km NE Quine
	Jorge / Leonardo	78 @ 3 km NE Quine
1805 <sup>ms</sup>	+ 8 Tomahawks	Joe / Emma / Nella <del>78</del> 40 @ 2 km NE "
"	+ 7 Tomahawks	Frosty / Erika 39 @ " "
	baited with banana	<del>3429</del> 281

at camp:

Jorge	40	6 km NNE Quine
Frosty	40	"
Jose Carlos	80	"
	160	

Total traps out = ~~4409~~ 1441 + 15 Tomahawks

Bolivia  
1991

26-27 May

M.L. Campbell

Quiñe

Journal

(48)

All traps were set ~~in~~ along the road back toward Quiñe, in forest + secondary growth.

Mazama  
scat  
along forest  
trail at  
3 km NE Quiñe

Jimi + my line looked good at first, following a dry stream through a grove of small trees, but then opened out onto a rock face that had been heavily cut over. Jorge + Leo were just up the road in similar habitat. The others went up to a well ~14 km back in beautiful forest full of bromeliads, epiphytes and orchids.

We saved the animals for tomorrow + went to bed early. Nothing in the 3 bat nets.

27 May

Clear in a.m. Up early to check traps. Nothing in my line. Jorge caught 1 Akodon on the border of field + forest. Up the road Frosty caught 2 Phyllotis like creatures, one with a very long tail. Marcello + Josi Carlos's line up a wooded wash yielded 2 Marmosa.

Trap results: 27 May

18°05'S 64°19'W	Jorge/Leo	1 <u>Akodon</u>	78
18°05'S 64°20'W	Frosty/Erika	2 <u>Phyllotis</u> + <u>Unknown</u>	73
18°03'S 64°19'W	Marcello/Josi Carlos	2 <u>Marmosa</u>	

18°02'S 64°19'W	6 km NE Quiñe	Jorge	1 <u>Marmosa</u>
64°19'W	"	Frosty	1 <u>Galea</u> / <u>Cavia?</u>

[7] traps animals  
of [1441] traps

nothing in Tomahawks

= [1.5%]

Traps out 27-28 May

	Marcel	60	6 Km NNE Quina
+ 3 Tomahawks banana bait	JED/JEW/EC	40	2 Km NE Quina
	"	80	"
	Jose Carlos	80	5 Km NE Quina
	Leonardo	38	2 Km NE Quina
	FWD	32	"
	"	40	"
	JAC, NSC	38	"
	"	40	"
		<hr/>	
		448 traps	+ 3 Tomahawks

27 May  
Quiñe

M.L. Campbell

Bolivia

Journal

1991

We will stay here one more night + leave for the puna tomorrow.

~~We pulled all trap lines except for Jose Carlos's line of 80 behind camp.~~

All trap lines were picked up in the morning + reset in the afternoon. Joe, Nella, Leonardo, Erika, Jose Carlos, Frosty and Jon drove up the road again to set traps. ~~With~~ Jose Carlos <sup>set</sup> traps again in the same wash as last night. ~~and then~~ <sup>They</sup> all ~~went~~ <sup>went</sup> ~~to~~ <sup>the</sup> road ~~is~~ <sup>is</sup> near the well in the west slope forest. This forest is

full of rocks, moss, lichens, ferns, orchids, and vines. The Phyllotis from yesterday came from here. ~~was~~ While setting traps Joe found a wonderful frog with eye spot mimicry on its back. Viewed from the rear in a defensive posture, it appeared to have two large eyes ~ 2cm apart. They also saw a small green snake, and found the skin of another snake, which showed saddle shaped blotches on its back.

I stayed back at camp and set 60 traps ~~was~~ in a nearby wash filled with thick cover + trees. I set along the stream bed itself under dense canopy, and then out to the edge along ecotone between thick brush and squash field.

Full moon tonight, cool. On the way

Bolivia  
1991

M. L. Campbell

Quine Journal

Back from ~~set~~ setting traps I saw a small bat, probably Myotis, flutter along ~ 20' off the ground along the edge of brush + field. We've caught no bats here, and the people say there are none except for Desmodus.

We prepped the rest of the animals in the evening and took down the lab. We leave tomorrow early to pick up traps + drive to our next locality near Totora.

28 May

Moon full on ~~southern~~ <sup>western</sup> horizon this morning at 6:00 a.m. My trap line yielded a Marmosa in dense cover under vines near the road in the wash. Another trap in the wash was torn open, by some carnivore, probably to get the mouse inside.

Total trap results 27-28 May:

6 KMNE Quine	Manil	<u>Marmosa</u>	1
2 KMWE Quine	JLD/JEW/EC	<u>Phyllotis</u>	1
"	" "	<u>Oligoryzomys</u>	1
"	Leonardo	<u>Phyllotis</u>	1
"	FWD	<u>Phyllotis</u>	1
"	JAC/NSC	<u>Phyllotis</u>	1
			6 animals

448 | 5.00  
448  
526

= 5 caught in traps, 1 by hand (Frosty)

5 of 448 traps =  $\approx 1\%$  success

28 May  
Quina →

M.L. Campbell

Bolivia

Journal

1991

We were on the road after picking up traps by 8:00 a.m. We returned to the highway at Quina and headed toward Cochabamba on the highway.

The road continued ~~to~~ climbing through cactus thorn scrubs. ~~At the~~ The cactus disappeared higher up, and eventually we could see the layer of clouds marking the border of the cloud forest, or "<sup>Siberia</sup> ~~Siberia~~". Passing into the clouds marked an abrupt transition from low scrubby vegetation + cultivated valleys in sun to thick forest with trees covered in mosses, ferns, and lichens, all hidden <sup>in fog.</sup> ~~in the fog.~~

~~The road through the Siberia~~ ~~was~~ The road through the Siberia ~~was~~ was windy, wet, and dangerous, marked by crosses which had their own share of moss + lichen covering them. The cliffs to either side were sheer in places, with a fern + lichen-covered rock face dripping water to one side and a drop into the clouds on the other.

We emerged back into the sunlight around 2500 meters, with hills still rising above us to the west. The slopes are vegetated with shrubs, grass, and some small trees with exfoliating reddish bark, genus Polylepis.

We stopped at a small cluster of huts

28 May

M. L. Campbell

Bolivia

Tinkusiri

Journal

1991

along the river, <sup>Ri</sup> Tinkusiri.

We made camp down by the river after speaking with the owner of a ranch along the road, who agreed to let us trap here.

As we were climbing higher in elevation yesterday we encountered a higher proportion of Indian population. Here all the inhabitants are Indian; the women are small and stocky, ~~with~~ standing no higher than 4 ft in cases. They wear beautifully colored skirts + blouses, with <sup>pink velvet blouses, blue skirts, colored shawls, gold</sup> white lacy petticoats and <sup>earrings</sup> broad brimmed hats. We disturbed two

young women washing clothes in the river at our campsite. They gathered their clothes up in silence, too shy to talk to us or meet our eyes. In general it appears that the men do the talking.

Quechua is the native language here, and Spanish is not known by everyone. There is a definite dimorphism in size between the sexes; the men stand at least a head taller than the women, and are generally less stocky. The people here make their living raising sheep and potatoes.

We set traps on arrival, ~5:00.

I set along the creek here, up into the ravine to the north. Nella set a line above me into the Polyepus forest on the west facing slope. Jorge set along the east facing slope,

17 Km E. Totorá, Tinkasivi, el. 2950  
17° 45' S, 65° 02' W

Captures 29 May

river line

(Microtus)

Trap 73

Akodon in shrubs, rocks

and grass along  
river bed (stream)

~ 10' from water

clear and cool last night

30°C. in a.m.

Joe saw ~~so~~ <sup>a</sup> fairly large, dark-colored  
rodent without a trail scurry across  
the path by the river this morning =

Cavia? Oryzomys? too  
small



28 May - 29 May

M.L. Campbell

Bolivia  
1991

Tinkusiri

Journal

and José Carlos set along the stream higher up the canyon. Frosty set traps to the west along another drainage, and Joe set traps below camp along the river south of the bridge. Bait with sardines, oatmeal, vanilla

Total traps out: 28-29 May

Jon, Jim,  
Marcello set  
4 bat nets  
across river  
& paths.  
Nella & I  
both saw

Frosty 70  
Joe 25  
Mariel 78  
Jose Carlos 80  
Nella 70  
Jorge 80

403 traps

bats flying;  
mine looked  
~ size of

Eptesicus  
or Lasiurus

No bats in  
nets.

Full moon tonight, and cold. The thermometer read 6°C around 10:00 p.m. With the humidity it felt colder. Fledged animals then to be

29 May

Hummingbirds  
in torpor  
under bridge;  
green chest

let feels warmer this morning, but the thermometer reads 3°C. Moon on horizon at 6:00 a.m.

I caught one animal on my line, a small brown Akodon-like creature which Joe calls Microtus. He says they also caught this genus in the <sup>Siberia</sup> ~~South America~~. It must be a mesic adapted species, because all but one were caught along the stream. Nella caught one 50' up the west slope at border between bean field and shrub thicket. Mine was caught in

Bat nets: a.m. of 29 May

hummingbird = "colibri"

"ataja-caminos" = night hawk =

403  $\overline{) 7.00}$   
403  
2770

Ctenomys sp. =

0.5 Km S. Llathu Pampa

el. 2500m

17°45'S 64°59'W

29 May  
Tinkusiri

M.L. Campbell

Journal

1991

the stream channel under shrubs in rocks.

Total captures this morning:

river bed	Marcel	1	<u>Microxys</u>
on slope above river	Nella	1	"
river bed	Joe	2	"
river bed up slope	Jose Carlos	3	"

[7] animals of 403 traps  
[1.7%]

In the late morning Nella + Jim decided to try to hitch a ride to Cochabamba to go to the market, since this is their last chance for highland shopping. Tomorrow is a holiday, so they had to go today. Erika decided to go with them. The ride is ~ 3-4 hours, but they will try to go and return tonight. Joe, Frosty, Jon, Jorge, and Jose Carlos took them into the nearest little town, Totora, to drop them off, and then went off to look for Ctenomys. The local people say they are here, and call them "tojo".

The people who live here say there are many foxes which eat their chickens. They also say there are small cats, probably Felis weidii.

The tuco-trappers returned tuco-less around 4:00, having spent the day driving from one place to the next on the basis of word of mouth evidence of tuco presence. In other words, people say they're there + they're not.

M. L. Campbell

Bolivia

1991

29 May  
Tinkusiri

Journal

On rebaiting my line in the afternoon I found an Oxymycterus in one of the traps. I also had another animal which escaped before I could identify it. Both were along the stream bed under shrubs. I checked Nella's line of 40 up the steep west facing slope and found a very interesting creature, a russet-brown Phyllotis-like animal with grey-white underbelly. It was in a trap on a very barren, eroded section of slope with small shrubs + some grass, cover ~ 40%; Polylepis trees within 20'.

Total captures for daytime May 29.

Mariel	<u>Oxymycterus</u>	1	
"	Unknown	1	escaped
Jorge	<u>Microxus</u>	1	
Nella	<u>Phyllotina</u>	1	
Jose Carlos	<u>Oxymycterus</u>	3	
			(6) (1 escaped)

Frosty did not check his line - he may have additional animals.

We reset ~150 traps tonight. I reset ~~the~~ 40 I pulled this morning from up the west slope down onto the stream channel opposite my previous line, so that I have two parallel lines, one to either side of the ~15' wide channel. All traps are within 10' of water. Rebait with oatmeal, sardines, vanilla

MLC

Captures 30 May clear & cool Trapcheck 7:45

D20 Oxymycterus under dense cover of  
shrubs, grass along bank of  
river, ~ 5' from water

shrub cover 25% *mucuna*

sweet-smelling herbs, dead leaves

B-89 <sup>oligo-</sup>Oryzomys along rock & soil ledge

under heavy tree canopy, shrubs

vines ~ 5' above water

along runway under ferns & roots

505 Oligoryzomys? ~ 3' above water

along same ledge as B-89; ferns,  
moss and leaves

88 \_\_\_\_\_ under rocks & ferns, trees &

same grass overhang ~ 2' from water

along rock ledge (west side of stream)

A5 \_\_\_\_\_ under shrubs at edge

of trail in open area of trail

junction near stream (~ 10' away)

cover 50%.

All 3 Tomahawks knocked over and closed,  
possibly by a dog.

29 May - 30 May

M.L. Campbell

Bolivia

Tinkusiri

Journal

1991

cl also set 3 Tomahawk traps along the stream, baited with ~~so~~ tuna.

Frosty set another 40 down opposite the bridge ~~at~~ near Jose's line of last night (which remains); Jose Carlos set another 40 up the canyon along the stream, and Jorge set another 30 up the east r-facing sb into the ~~opposite~~ next drainage.

Total traps ~~of~~ out ~~to~~ 29 May:

Maribel	78	+ 3 Tomahawks
Jose Carlos	124	74 + 40
Nella	40	
Joe	25	
Frosty	40 + 40	+ 2 Tomahawk
	<del>20</del>	
Jorge	<del>103</del>	<del>100 + 100</del>
	400	

~~Washed down the traps.~~

~~Washed down the traps.~~

We stayed up late prepping animals. cl finished last, as usual, and the others stayed up playing poker, drinking tequila + eating garlic (Joe). We left 3 animals to prep in the morning. Clear + cold.

30 May.

More animals in the traps this morning. Perhaps the fact that the moon now rises

Captures 30 May - afternoon check:

- none on my line

NSC line up west <sup>facing</sup> slope:

Trap 69: Akodon

rocks, grass, small shrubs  
Polygona trees on steep  
(45°+) slope above  
river (100' below).

ferns, lichens on rocks,  
composites, etc. open,  
cover ~ 40%.

(66)

M. C. Campbell

Bolivia

29-30 May  
Tinkasiri

Journal

1991

a few hours after dark is resulting in higher capture rate. Also, the fact that these animals have been active in the day may be due to the full moon at night. Perhaps facing diurnal predators they can see is better than facing nocturnal predators with the moon on their side.

Total captures this a.m. - 30 May

(see p. 63)	Number	Species
Maribel	5	oxymycterus 1 Oligoryzomys 1 Phyllotis 2 Microxus 1
Jose Carlos	6	oxymycterus 1 Akodon 1 Akodon 1
Frosty	1	Marmosa 1
Torge	2	Marmosa 1 Akodon 1
Nella	0	<del>Marmosa</del>
Joe	0	
		14 Animals of 400 traps

Joe took everyone ~~one~~ off to look for ctenomys again today. I stayed in camp to watch things & wait for Nella, Jim & Erika. They arrived ~ 1:00 on a bus from Cochabamba. We spent the afternoon picking up camp, washing clothes etc.

Joe et al arrived ~~again~~ around 5:00, this time with ctenomys. They found them in a field ~ 4 km away. They brought back 4 individuals, 3 alive & 1 dead, after only a couple hours of trapping. They are interesting animals. Joe thinks



see page 72

+ Felis domesticus in Tomahawk

Captures 31 May

clear, cold, w/ frost. moon rise ~ 2 hrs after dark

Trap B-90

Microxus under shrubs at

edge of stream

good leaf litter; cover 95%.

large scat of a rodent? rat-like but nearly an inch long. on rock in stream. large rodents here? or bird?

B-111

Microxus on ledge ~ 10' above

stream under ~~the~~ overhang of trees,

vines, shrubs, ferns, composites.

many rocks. cover 90% at shrub level.

643

Phyllotis along rock ledge under

ferns, roots, shrubs, trees.

Same <sup>place</sup> as B-89 yesterday.

T4

Oryzomys under rocks & grass &

tree overhang. same

as 88 yesterday

595

Oligoryzomys next to clump of

Pampas grass in shrubs

& trees on bank ~ 4' from

water. cover 80%.

B-79

Oryzomys under rock ledge, ferns

composites, shrubs at edge

of stream. Mña present.

cover 60%.

539

Calomys in shrubs, trees, grass, forbs, shade above stream (~ 4') cover 90%.

30 May

M.L. Campbell

Tinkusiri

Journal

they may be new because they ~~have~~ make squeaking noises he's never heard before. otherwise they look like a member of the Ctenomys Prater group. They are darkish brown, too dark for opimus.

Traps in the afternoon yielded the following  
30 May p.m. check:

~~Nella~~ Akodon 1 (see p. 65)

Jorge Microxus 2 1

JCH Microxus 1

3 animals

Total animals for today

14 + 3 + 4 = 21

Total traps out tonight: 30 May - 31 May

Jorge 100 + 2 Tomahawks

NSC 40

JCH 36 + 3 Tomahawks

" 72

MCC 78 + 3 Tomahawks

FWD 38 + 4 Tomahawks

" 40

404 + 12 Tomahawks

Many traps still have animals & couldn't be set. Others are being used for two-trapping.

We stayed up till 2 am prepping.

We finished with the others this time with Erika's  
h. do

Mammals - appear to be Thylamys  
Small  
no parasites  
no stomach contents

Some boys brought in a dead  
Thamnophis - like snake they killed  
by the river. I prepped it for the  
museum.

The river has small black tadpoles  
in the pools. In a deep pool upstream  
I found what may be the adults -  
aquatic frogs swimming below the  
surface, at least 2 per pool.

(70)

Bolivia

1991

30-31 May  
Tinkusiri

m.l. Campbell  
Journal

A Sturnira in the bat nets tonight.

This must be a record for altitude.

It was in the net closest to camp over the river, flying low. I haven't seen any fruit it could be feeding on. Jorge says there are other records of Sturnira from high altitude.

The night was extremely cold & wet, with heavy dew.

Other events I note today: Frosty saw two Salicth's playing near his trap line downstream, around 5:30 in evening.

Joe & Jorge went to the meeting this afternoon, where they received a hearing, were asked for their credentials, and were politely told to come back later.

Marcello found out about the tucos-field from Ing. Jaime Ponce in the morning, so when he came by camp. Apparently the campesinos told him about us & he came to check us out. He works with the people here (120 families) through Organization de Produccion de Trigo, giving advice on wheat production.

31 May

The dew of last night was frost this morning. Still clear. Marcello, Leo & I stayed at camp while the others went in search of tucos-tucos. They will be gone all day. Meanwhile we three will

31 May - June

M. L. Campbell

Tinkusiri

Journal

prep animals.

Trap results for 30-31 May

404  
17.00  
1616  
840

Maniel	7	See p. 67 +
Jose Carlos	5	Microxus
J&B	2	oligoryzomys
		Oxymycterus
Nella	1	Oxymycterus
FWD	2	marmosa Akodon

17 of 404 traps  
~ 4%

+ 1 Felis domesticus in Tomahawk along river

One of our animals from last night disappeared during processing. It was JCH's # B-5, NK 22851.

Jose Carlos saw a Mazama gouazoubira up the ravine today, <sup>up</sup> a side canyon on the hill. It had a white tail and orangish underparts. There are many tracks by the river, most of which are sheep but some smaller ones may be deer.

Jose Carlos pulled 80 of his traps; I pulled 20 of mine, ~~etc~~

Total traps of 31 May - 1 June

Maniel	58	+ 2 Tomahawks
Nella	40 (98)	
MLC/LMF	100	
Jorge	100	+ 3 Tomahawks
Jose Carlos	30 (20)	+ 3 Tomahawks
Frosty	36	
	<u>330</u>	Shermans + 8 Tomahawks
	262	

Trap results 1 June

(98 traps)

MLC/LMF line

moon rise ~ 9 pm, cold but only a little frost

B-115 Oryzomys in rocks, trees, shrubs  
~ 5' above stream

MLC line (58) traps

B102

Oryzomys

rocks + trees  
above stream

heavy cover = 90%

3 traps stolen this locality

31 May - 1 June

M. L. Campbell

Bolivia

Tin Kusiri

Journal

1991

The tuco-trappers returned from tuco-hunting with 5 Ctenomys. Tom & Jim have been the major tuco trappers, catching most of them in their field down by a river below a bellacious one km hike down from the road. The tuco locality is 0.5 km S. of Lluthu Pampa

Done early with prepping - by 11:00 pm. We pack up tomorrow & head down to the "siberia" forest, then onto Valle Grande.

The 11:30 bat net check yielded a Tasius borealis, bright orange.

### 1 June

Clear & ~~cool~~ cool in a.m. Moon on western horizon, waning, at 7:00 a.m. Less a my line of 98 only resulted in 1 Oryzomys. Perhaps leaving the trap lines out more than one night does result in higher trap success on subsequent nights.

We prepped animals all morning & early afternoon, then picked up camp. We head down to the vicinity of the Siberia today. Joe has already sampled that habitat on previous trips, but they need to have 1000 trap nights at all localities and lack one night's worth of trapping there.

1  
2 June

M.L. Campbell

Bolivia

1991

Tinkusiri →

Journal

Trap results from 1 June, a.m.

Marcel	<u>Oryzomys</u>	1
MCC/LMF	<u>Oryzomys</u>	1
JCH	<u>Oryzomys</u>	1
	<u>Microxus</u>	4
	<u>Akodon</u>	1
NSC	<u>Phyllotis</u>	2
JSB	<u>Akodon</u>	2
	<u>Microxus</u>	1
	<u>Oryzomys</u>	1
	<u>Oryzomys</u>	1

of 362 traps

What we have been calling Akodon may just be a darker-colored Microxus. Both forms have a white chin. We definitely have Oryzomys longicaudatus, and then

Tinkusiri another small oryzomyine. Total species here for

28 May - 1 June: Oryzomys

Microxus

Oryzomys longicaudatus

Phyllotis ?

Marmosa

Calomys

Oligoryzomys



3 Km by rd N Torrecillas

11 Km by rd NW Torrecillas (Siberia)

17° 49' 56.4" W 2650 m

1 June  
Tinkusiri - Torrecillas

M. L. Campbell

Bolina  
1991

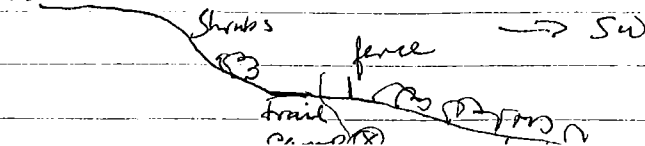
Journal

We didn't break camp till after 3:00, and it was dark by the time we reached the "siberia". The fog that always envelops this stretch of highway, in combination with thick slippery mud, made this drive especially treacherous after dark. We ruled out trying to set traps almost immediately.

Joe drove beyond the fog and found a pull-off where we decided to camp. This is below the cloud line & therefore below the forest. We couldn't see at all, other than that we were camped along a bicycle trail below a rock ledge below the highway, and above a steep drop-off to the southwest. Vegetation consists primarily of shrubs & bunch grass. We decided to go ahead & set traps here even though we ~~don't~~ may be close to people.

Walla & I set a line of 80 along a narrow strip of shrubs & Pampas grass along the trail between rock ledge & the drop-off to the SW. Jim, Jon, Joe, Jorge, & Tore set traps down the SW facing slope, and Frosty set traps above the rock ledge.

road



Bolivia  
19911-2 June  
Torrecillas  
→ Siberia

M. L. Campbell

## Journal

Total traps out 1-2 June: <sup>3km N</sup> Torrecillas

Manuel + Nella	80
Joe	80
Frosty	59
Jose	80
Jim + Jon	69
Jorge	80
	<b>448</b> traps

Windy, cool + occasional light sprinkles this evening when the clouds above us occasionally descend. To bed early.

2 June

Misty + cool this morning. We were awakened at 6:30 a.m. by a local campesino who wondered what we were doing so close to his house. What we couldn't see last night was that the slope below us is covered with farms + houses. Jorge's line, at least, crosses this man's <sup>pea</sup> bean field. We picked the traps up quickly and didn't lose any.

Trap results 2 June:

Joe 2 Akodon  
Jim + Jon 1 Galen

**3** of **448** traps

We will try to keep these alive till our next locality. We decided to set traps in the Siberia this afternoon.

2 June

m. L. Campbell

Bolivia

1991

Torrecillas Siberia

Journal

rather than break camp & go to Valle Grande (a day's drive), even though it is windy, cold, and uncomfortable. Joe needs one more trap night (of 400 traps) here. We went out at 2:00 pm to set traps, driving back up into the fog.

Everyone wore complete rainsuits and rainboots, and we needed them.

The forest is absolutely spectacular here. The first thing I noticed, aside from the craggy, lichen covered trees looming above us in the fog, were the tree ferns. These stand ~ 2m in height. Marcello says the local people cut them down & sell the trunks for planters. He & I set a line of 120 traps up a south/west facing slope to the north of the road.

Once we entered the forest it ceased to be ominous and became breathtaking. The ubiquitous cattle have trampled everything & made a muddy path wamp, but still the forest floor is covered with ferns, moss, forbs, shrubs, and fallen trees completely enveloped in undergrowth. We found mushrooms ~ 2 feet in height, with a bell shaped cap

2 June

M.L. Campbell

Sernania Siberia → Torreillas

Journal

The ground is so wet I can't imagine that rodents make burrows. They must instead use the numerous fallen logs for nests, or perhaps in rocks. ~~Along~~ We saw many holes under trees, next to logs, and along rock faces, including some very large ( $\approx 6^+$  in diam) burrows.

Jon saw  
a grey  
squirrel

Similar to  
eastern grey  
squirrel in U.S.

The rodents here may also bite in the lichen, fern & moss covered trees, some of which are  $3^+$  in diameter. We set some traps up in trees or along fallen branches.

Our line travelled up the slope from the road down into a ravine, up to the top of the hill & back down the other side, then back again to the road, making a half circle trap line. Traps set  $\approx 10$  paces, 2 per station, bait with oatmeal, pardons, vanilla.

Jim & Jon set traps across the road downslope. Joe, Nella, Frisky, Jorge, & Jose set traps up the road a way.

Total traps out: 2 June

Maul/mucillo	120
Jim/Jon	120
Jorge/José	120
Joe	40
Nella/Frisky	40

740
-----

2-3 June  
Serrania  
Siberia - Torrecillas

W. L. Campbell

Bolivia

Journal

1991

While setting traps I stepped down into leaf litter & debris & heard something squeal. I guess animals live in tunnels in the forest floor after all. We couldn't find whatever made the noise.

Drove back in fog to camp. Still windy & cold. Surprisingly it was warm in the cloud forest. Once inside we were sheltered & warm. Too bad our camp isn't there. We'd only have to contend with the mud vs. wind. To bed early, moon rising late.

3 June

Packed up camp + a.m., then to check traps. The wind stopped early this morning, and the air was calm & balmy. In the S. baria the fog had moved higher up the mountains, and we had sunshine in the forest through the tree ferns. I was mistaken ~~for~~ yesterday; some are close to 4 meters tall.

total  
for everyone: Spp. Microxus, Oxyrycterus, ~~and~~ Oligoryzomys and a large, dark eared Oryzomyine that Jorge thinks might be Thomasomys.

Total animals 2-3 June:

MCC/MZ	8	JAC	1
JEW/JLD	8	JSB/JCH	7
NSC/FWD	8		
			<b>32</b> animals

Bolivia

1991

2 June

Torrecillas

Serrania

Siberia → Est. Laja Journal

M. L. Campbell

32 animals of 440 traps =  $\boxed{\sim 7\%}$ 

Total spp:

MicrotusOxymyzomysOligoryzomysThomasomys ? =  $\boxed{14 \text{ spp.}}$ 

We were on the road heading down the mountain by noon. Stopped in Comarapa to buy food, then on towards Valle Grande. When we reached Quiñe, we decided to take a detour via Estancia Laja Laja on an alternate route to Valle Grande. This road is apparently bad in places, but it passes by an important Bolomys locality Jorge wants to sample, 5 km from downtown Est. Laja.

We drove up a windy, narrow and beautiful road up along the crests of the hills to the S of Quiñe. Mountains stretch in every direction and the cloud forest is visible in its permanent mist to the west behind us. We camped at a ranch ~ 6 km by rd N of Est. Laja, and set traps along some exposed rock ridges ~ 5 km N by rd Est. Laja. My line went along the crest of a ridge with scattered ferns, lichens, cycads, and bromeliads, along a north facing slope. Jorge Carlo set a line of 80 closer to camp along another N slope.

Bolivia

1991

2 June

Torrecillas

Serrania

Siberia → Est. Laja Journal

M. L. Campbell

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89

17 km by Rd S of Quine

18° 12' S 64° 18' W

Trap results <sup>3-</sup> 4 June Estancia Lake

no wind, clear, warm

Trap 57 Phyllotis in rocks overhang  
on rocky ledge in

montane shrubland, el. 2100 m

bare rock face covered with

lichens, bromeliads, Senecio,

small trees (bent by wind), ferns

and cycads. E-facing slope.

Some  
Baccharis  
cylindrica

= vegetation from  
cloud forest  
Some spp-

Saw a Snake on some rock ledge,  
8:45 a.m., no wind, moving between rock and  
cycads, ferns. Probably same species as  
the skin Joe & Nella picked up 2 km NE Quine.

Pattern brown saddle blotches on beige-  
colubrid, small head. Like a cross between  
a bull snake (Pituophis) and a garter (Thamnophis)  
I only saw part of it, but it may have been  
a foot or so in length.

Trap B-91 Phyllotis along rock ledge.

Joe's traps

55

@ Galea

C 32

Calomys

Jon's

B-38

Phyllotis

52

"

Jim

650

"

897

17 km by Rd S of Quine

18° 12' S 64° 18' W

Trap results <sup>3-</sup> 4 June Estancia Lake

no wind, clear, warm

Trap 57 Phyllotis in rocks overhang

on rocky ledge in  
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Baccharis  
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= vegetation from  
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@ Galea  
calomys

C 32

Jon's

B-38

Phyllotis

52

"

Jim

650

"

3-4 June

M. L. Campbell

Est. Laja, S. Quinze

Journal

Total traps out 3-4 June:

MLC	40	17 km S Quinze
LMF	40	"
JAC	40	"
JEW	40	"
JSB	80	"
JLD	80	"
JCH	80	km S Quinze

400 traps (many still with live animals in them)

Very windy in early evening, with grey clouds rolling in from the north. ~~Beautiful~~ Beautiful sunset looking out over grey blue mountains. We stayed up till 2:30 a.m. prepping animals from the siberia. Moon at  $\frac{1}{2}$  waning, rising late.

4 June

Calm this morning. The sky cleared overnight, with clouds only on the horizon to the north west. ~~No~~ Mist below us in the valley.

Trap results: 17 km S Quinze

17 km S Quinze	Marcel	2	Phyllotis
"	Jim	1	"
"	Joe	2	Savia 1 Calomys 1
"	Jon	2	Phyllotis + 4 emb. born in trap
1 km S Quinze	José	2	Marmosa Phyllotis

9 of 400 traps

400  $\frac{2}{19.00}$

Bolivia  
19914 June  
Est. Laja

M.L. Campbell

→ Ariruma

Journal

We packed up camp and were on the road towards Valle Grande by 1:00 pm. Which road, however, was the question.

We drove into Estancia Laja, a fairly sizable pueblo ~~at~~ with running water from a tap installed by Unicef. Once in Laja, we were directed to ~~the~~ a road winding out of town to the ~~SE~~ NE, heading ~~down into the~~ along a ridge above a deep valley. The road progressively narrowed, finally becoming nothing more than a cattle track, yet it was always just wide enough for the truck to pass.

Some of the ~~low~~ hairpin turns were fairly tight, however. We drove ~ 2 hrs, finally arriving in the little town of

Rto  
Ariruma

Ariruma, where they told us we had another 2 hr drive to Valle Grande, "si van rápido." We decided to find a good place to spend the night along the way. We drove out of town along a beautiful <sup>rocky</sup> little valley, with steep forested sides + a little stream. The forest here is dense by dry, with occasional tall cacti, + trees of family Leguminosae + Malvaceae? together.

We stopped at a slight widening of the road along the stream + pitched tents. There are several nearby farms, but we

93

7 km SE by rd  
Arirama el. ~~17~~ 1750 m  
Traps out 4-5 June

MLC	80	S. facing slope
JSB	80	up canyon to south (E-west)
JAC	40	
JCH	<del>80</del>	
LMP/ECS	80	
FWD	$\frac{80}{(440)}$	traps

3 bat nets over stream  
= 2 Sturnira

4 June

Bolivia

Río  
Arimama

M.L. Campbell

1991

Journal

set all the traps anyway. Jorge, Frosty,  
 & Jose went up along stream & N-facing  
 slope above camp. Leo & Erica  
 set along the stream below camp. Joe  
 set along the stream above camp.  
 I set across the stream behind a  
 farmhouse up the S-facing slope.

This part of the forest was heavily  
 trampled by cows & cut over by  
 people. Canopy at 20-25', but very  
 little understory due to trampling.

Some fallen logs, forbs, leaf litter. Slope  
 ~60°, some parts eroded badly.

Will save the animals from this  
 morning to prep tomorrow. Played ammo boxes  
 in evening. We have 3 bat nets set.

Two Sturnira as of 9:15 pm.

There are some neat frogs here. One  
 has a very musical call ~~like~~ which I  
 recorded. There are at least two large  
 Hylids in the stream. One is a med size,  
 delicate bright green species with pale underbelly.  
 The other is a large, muscular, olive drab-  
 brownish species. The latter ~~two~~ species has  
 very muscular forearms. Both individuals  
 I looked at were males, according to Norcillo.  
 The olive green one definitely was, as I caught  
 it calling, a low series of repeated  
 notes. There is another frog with rear eye spot.

95

Rio Ariruma  
7 Km SE Ariruma el. 1750'  
by rd

Trap results 4-5 June

~~Phyllotis~~ scattered clouds in a.m.  
dew

Trap 521 Phyllotis along edge of plowed field  
in dense secondary growth  
shrubs, forbs, trees, E-slope

574 Phyllotis in dense cover of forbs,  
shrubs, vines, fallen logs,  
at edge of plowed field ~  
50' from stream; cover 25%

611 Dryomys along fallen tree ~ 1 meter  
above ground in thick  
cover of shrubs, vines, forbs

C8 Marmosa under shrubs, dry brush  
dead leaves, forbs,  
~ 35 meters up S facing slope  
cover at shrub layer = 80%  
tree canopy 3-6 m = 30%  
(Acacia, legume)

B18 Marmosa along ledge of dirt + roots  
in forbs, shrubs, trees  
canopy 50% at 20-25'  
~ 25 meter up slope

440/1000  
1800  
1200

Bolivia

M. L. Campbell

1991

Rio Ariruma → Valle Grande Journal

Clear + balmy at night. The stream the frogs are in is cool, 60's Fahrenheit, and well oxygenated, with many little waterfalls. Tadpoles + small catfish also present.

5 June

Clear + warm in a.m. My trap results are on the opposite page.

Total trap results 4-5 June:

MLC	5	Mammora 2 2 Phyllotis
JCH	2	Mammora
JAC	1	Oligoryzomys
FWD	2	

$$\boxed{10} \text{ of } \boxed{440} \text{ traps} = \boxed{22}$$

Nothing but the 2 Stenomys from last night on the bat nets.

Packed up camp, washed clothes etc. On road by ~~11:00~~ 11:00 or before. We stopped to ask every person we saw on the way if they knew where we could find Stenomys ("cutuchi" here). Most people knew what they were but hadn't seen any around. We went into Valle Grande and had lunch, bought groceries, then spent the afternoon looking for tucos, which we found in small numbers, and then for a camping site, which was more difficult. We finally camped near our tuco-field at the grounds of the school 5.5 km NNE Valle Grande



97

Traps out 5-6 June Rio Cienega

MLC	80
JEW	80
JSB	80
NSC	80
LMC/ECS	<u>80</u>
	400

5-6 June

M.L. Campbell

Bolivia

1991

## Rio Cienega Vello Grande Journal

Jorge, Jim, Nella, Leo, Erika & I set traps after arrival.

Jorge went up the hill behind the school along a rock wall and in disturbed secondary growth.

Leo & Erika went across the road into thick thorn scrub trampled by cows. Nella set near the river above on the embankment. I set along the river itself in dense shrubs & trees (Prosopis, Acacia, Ximonia), and Jim set up along a south facing hill above the river in dense thorn scrub. Total traps out = 400

~~7~~

Jose Carlos & Frosty went off to set two traps in the nearby field. We set up the lab & prepped animals till 3:00 a.m.

~~After dinner~~ JCH & FWD caught Ctenomys boliviensis within a couple of hours.

Calm & warm, moon rising late.

Three bat nets out yielded 2 Tadarida and 1 Histiotus sp. before midnight(?).

The Histiotus may be a new record for Santa Cruz. All were caught in a net set behind the schoolhouse. I believe they are roosting in the eaves of the tile & ~~the~~<sup>wood</sup> roof.

6 June

Rain this morning, few clouds. Cold with Southern front weather. We were woken at 7:00 by a man Joe had given two Stermans to yesterday. He brought them back with a Mus musculus.

99

Captures 6 June clouds, mist, light sprinkles in am

Trap 73 Marmosa under cover of shrubs  
+ vines ~ 30' from river  
thin border of vegetation

W. L. Campbell

Bolivia  
1991

Valle Grande

Journal

Total animals from 5-6 June:

Maribel	1	Marmosa
Nella	1	Phyllotis
Jorge	4	Marmosa 3 Phyllotis 1
	<u>16</u>	$\sqrt{400}$ traps
		<u><math>= \sqrt{1.576}</math></u>

= 2 spp

Leo, Erika + Nella pulled their trap lines. All others left out.

We prepped all day. In late afternoon FWD + JCH returned with 13 more Chomys. We prepped 9 in the evening + left the rest for tomorrow. Still cold + windy. We may leave tomorrow.

Leo, ~~Erika~~ + Nella reset traps up the hill near ~~the~~ Jorge's line of last night.

Total traps out 6-7 June

MLC	80
JEW	80
LNF	} 120
NSC	
Jorge	<u>876</u>
	<u>396</u>

Captures 7 June

overcast, cool, no wind

- 83 Mammosa in pile of dead twigs, leaves  
in forks, shrubs, Kimenia  
~ 30' from river.
- 588 Akodon undertree, shrubs, Forbs as above
- B-39 Phyllotis along rock wall overgrown  
with trees, + shrubs, Forbs  
~ 40' ~~at~~ From river
- B-141 Oligoryzomys same as above (B-39)
- B-103 Phyllotis same, under tangle of rocks  
& roots
- 72 = B-166 Phyllotis same
- 585 Phyllotis dense cover of shrubs +  
vines ~ 40' from water

$$\begin{array}{r} 396 \\ 13 \overline{) 1300} \\ \underline{118} \phantom{0} \\ 1120 \end{array}$$

Bolivia

1991

M.L. Campbell

Journal

7 June

Overcast, cool in a.m. Trap success was better this morning.

Total animal 6-7 June

Marcel	7	(see opp page)
LME/NSC	5	2 <u>Phyllotis</u>
		2 <u>Marmosa</u>
Jim	0	
Jorge	1	<u>Marmosa</u>
Nella	0	

$\boxed{13}$  of  $\boxed{396}$  traps  
 $\approx \boxed{3\%}$

Prepped all the tucos, including 2 Ctenomys FWD brought in from last night in the morning. All other animals we take back to Santa Cruz to prep. Packed up camp and on road by 3:30 pm for the 5 hr drive to Santa Cruz.

M.L. Campbell

Bolivia  
1991

## Journal

12 June Las Lomitas; 15 km S Santa Cruz  
Dept. Santa Cruz, Bolivia

Camp set  
by 11 June

We've spent the last several days in town getting Joe, Nella + Jim ready to leave and organizing for the field. Frosty, Jon and I spend the next three weeks catching Ctenomys in the vicinity of Santa Cruz. Our first locality (above) is a site which was sampled in '87 and '88, both times with the aim of extirpating two populations in several fields. It is also a locality for a chromosomal polymorphism in diploid number within the same population.

I've missed the first two days of collection information because I've been running errands in town. The first day Jon, Frosty, Maria Dolores Carreras, and Romer Misereantino were dropped off to set up camp + I set out two traps. I accompanied Joe, Nella, Jim, Jose Carlos, and Otto Jordan back to town to get additional supplies + bring the truck back. The Alaskanites all ~~leave~~ left at 11:00 pm Tuesday evening with the specimens collected to date, which are to be cleaned + identified in New Mexico. When I arrived back at camp ~ 6:00 pm, the field crew had already collected (13) Ctenomys boliviensis from a field extirpated in '87 + '88.

105

{ Romano Gentile of Santa Cruz  
Mary la Torre abogado  
owners of Las Hermitas property



Bolivia  
1991

M.L. Campbell

Les Limites

Journal

~~Our~~ Our situation with students will be a little strange over the next several days; since they are in exams, none can come for more than a couple of days, and ~~we~~ we will be rotating students constantly. Consequently names of people in the crew will be changing each day. Our core group consists of me, Jon, and Frosty.

No Shermans out last night or tonight.

~~Today~~ Last night (11 June) we noticed huge numbers of bats flying overhead apparently eating insects. Our camp is in the yard between two tile roof buildings of an estancia owned by Dr. Mary La Torre, a lawyer in Santa Cruz:

Calle OruroFinal Republicana 324

I went into town to talk to her today, as the caretaker of her farm, Carlos, told me she would like to see us. I actually spoke to her for less than a minute, as she was leaving when I arrived. She said there was ~~no~~ absolutely no problem with our staying there, and she hoped we would get rid of her ~~to~~ cebuchis. She also said we could use a screened in porch/backhouse as a laboratory in the future, rather than our current tent set up.

This area ~~has~~ ~~is~~ is an agricultural

M. L. Campbell

Bolivia

Las Lomitas

Journal

1971

region in various stages of regrowth, from pasture to sugar cane field to 6' tall cane/grass in an ~~an~~ unoccupied pasture.

There ~~is~~ are also patches of forest, mostly secondary growth ~ 20-30 years old, as well as a narrow strip, ~~is~~ sometimes nonexistent, of riparian woodlands along the river (Rio

The first night we heard some nocturnal animal make a loud, eerie call close to camp. It sounded like a cross between a monkey + a bird. Very strange.

Today while I was in town Davis et al caught another 5 *Aekrogys* (2 at night, 3 in a.m.).

Carlos's wife says there are monkeys here in the woods next to the house

I returned in the afternoon with bat nets. Jon + I set up two ~~at~~ between the buildings where we'd seen the bats flying last night.

Carlos the caretaker says they roost in one of the buildings (unoccupied) under the roof tiles. We caught bats almost immediately, in nets at 7:30 pm. They are some sort of *Molossid*, but not *Tadarida*. 19 bats by 9:00 pm. *Molossus molossus*

Prepped till 4:00 a.m. last night + 2:00 a.m. this morning. Moon new; dark all night. Heavy dew.

13 June

Slept till 9:00 this morning. Sunny, ~~the~~ warm

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Las Lomitas

Journal  
~~Sketches~~

1911

with scattered clouds. More tucos last night (~ 4), most from Jon's traps. Maria Dolores ~~and~~ <sup>and</sup> I hung around camp while Jon + Frosty checked traps, as there are still many specimens to be skinned. I found a young Histiotis semicinctus in the sand next to the house. They must be abundant here, as I saw one in 1987 here also.

Jon saw a green vine snake / racer in the shrubs at eye level - both were equally startled. I also saw a Urosaurus - like tree lizard in the orange tree next to the house.

Maria Dolores + I set 8 pairs of tucos traps in the afternoon along the road into the estancia. Most new burrows were within 5 ft of the road or relatively high ground, in dense shrubs + tall grass of the overgrown pasture to either side. While setting traps I could hear tucos munching plants, with occasional plants waving in the distance as they were eaten from below.

Total Sherman  
traps

13-14 June

= 80

Late afternoon I set two lines of 40 traps each (Sherman). ~~is~~ One line of 40 was set along a fence line between overgrown, tree filled pasture and what used to be a garden area in 1987, <sup>but</sup> ~~is~~ now a ~~open~~ field completely overgrown with 6' tall grass, shrubs + forbs.

My line followed the fence line down to the riverbank, then doubled back to form 2 parallel lines <sup>of 20 traps each</sup> 20' apart, traps set @ 10 paces, 2 per station, bait w/

Trip results 14 June

clear, dew, warm. dew moon

Nothing in my two traps.

Forest line: most traps knocked shut  
by cows or other large animal  
= including Tomahawk

692 Marmosa on small rise of high  
ground in secondary growth  
woodland; on ground in  
dead leaves; some foliage.  
Next to clearing filled with  
shrubs, vines; cover at ground  
10%; shrubs = 40%, canopy  
30% at 20-40'.

Overgrown field:F 30: Philander opossum

along fence in heavy cover of  
shrubs and tall grass; cover  
at ground 20% - 100%; shrub layer  
50%; canopy 20% at 30'.

Saw a Sylvilagus brasiliensis in field near  
camp at night

13 June: → Bat netstook down net over truck  
only 1 net up

1 Artibeus ~~lituratus~~ lituratus - late  
1 Molossus

Bolivia

1991

M. L. Campbell

Las Lomitas

Journal

Emma Luna - Pizarro showed up in the evening to help out. She will leave again in the morning. I cooked dinner while everyone worked; we all worked till 4:00 am. - Muchos animales, pocas personas. Still, our tuco catch is winding down.

14 June 1991

Dropped Emma off at a micro stop on the way towards S.L. this morning. Clear, dew, warm. No tuco in my traps this morning.

Sherman trap results on opposite page:

1 Mammal1 Philander2 of 80 traps = ~~2~~ 2.5 / 20

Jon + I take Maria Dolores back to town today and pick up Romer + any other students who can come. We will be back late, most likely.

I left my traps out. Total traps <sup>Sherman</sup> 14-15 June = 80

Two tuco in the traps in the afternoon. 2 Tamias

We left for town ~ 2:30, returned 9:00 p.m. with Romer.

No other students. While we were gone Frosty scouted about camp for tuco localities, he went across the river and spoke to a family who owned a yucca field about catching tuco there. We've pulled all traps except capture sites, and we will reset the rest tomorrow at new sites.

Frosty saw a small cat while crossing the river. He said it looked black, and was



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Bolivia

(1971)

Las Lomitas

Journal

bigger than a bobcat. He was  $\sim 1/4$  mile away, and so is fairly certain it was a cat from the way it ran. It also could have been an Elva.

15 June

My trap results for this morning are on opposite page. One of the "Proechimys" is actually something else, and may be a rat or a Chipidomys. Nothing in two traps (mine). I pulled them all.  $\# \text{ animals of } 80 \text{ traps} = \boxed{52}$ .

Spent the morning picking up camp & cooking lunch while the others mapped two holes & reset traps across the river.

Romer & I heard monkeys this morning  $\sim 1/4$  mile away across the road to the north. He says they are Saimiri. The caretaker here says they are "plomizo" in color. The call was loud, perhaps cebus? We also saw deer tracks on my line in the woods, Mazama. Romer knows a good deal about large mammals such as deer from the perspective of a hunter/biologist. He pointed out the fruits of the Swartzia tree which attract the deer. He says the numerous large tunnels/runways in the dense grass of the pasture are armadillo = Dasypus. He also says the hole I set the ~~to~~ Tomahawk in front of belongs to a bird.

The people here say there are foxes, possums, cats (gato montes) and <sup>skunks</sup> monkeys living in the vicinity.

115

MOS in a.m.

Trap check 16 June Las Lomitas

Warm, overcast, slight breeze ~ new moon

woods: nada

old garden:

- B 97 Marmosa along fence line in dense brush  
NK 23117

Rovers line:

1 Bolomys Trap 70 in woods along river

Bat nets 15 June:

1 Myotis 07



Bolivia  
1991

M.L. Campbell

Las Lomitas

Journal

(1) A dead tucso in a Sherman disappeared today from camp. The pig may have carried it off, but we can't find the trap. It was an important male, and bad to lose.

Frosty, Romer, & Jon set traps ~~across~~<sup>in</sup> the mandarin banana field again next to camp to make sure they're eliminated the population. Some new mounds were present on the other side of the fence in the pasture. They caught 1 *Ctenomys* within 1/2 hr.

Jose Carlos showed up to help in the afternoon. He waded from the turn off to Las Lomitas. It's good to have him back in the field with us.

(1) Romer set another 40 Shermans in the thin border of riparian woodland on the other side of the river. He also set 7 Tomahawks.

Total traps (Shermans) out 15-16 June:

80 MLC

40 RM

120	+ 8 Tomahawks
-----	---------------

Jon & Jose Carlos set up another net in the mandarin/banana field. We've seen bats flitting among the trees very low every evening at sunset.

(1) Prepped till 1:20 (early!). No bats. Left skins to prep for tomorrow.

117

(Toto) Manuel Talamás fono 325875  
air traffic controller at aeropuerto

Johnny Roca fono 331179  
pilot

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Bolivia  
1991

Las Lomitas

Journal

16 June

One Marmosa in my lines this morning.  
Romer caught 1 Bolomys in woods across the river.

2 animals of 120 traps = 1.22!

We prepped in the morning till early afternoon. In the afternoon Frosty, Jon, Jose Carlos & Romer went off to check traps. I haven't been able to keep track of two captures, but I believe there were ~ 5 Atenomys brought in today, plus a baby Frosty found in a tunnel entrance, for a total of 6. My guess is the baby went looking for its mother which may have been one of our captures. It was not yet weaned, but fully furred with eyes closed.

I left my trap line set as I haven't had time to move it. Romer left his traps out also, although he had to leave this afternoon because of classes. He showed Jose Carlos where they were. ~~Jose~~ Jose is also leaving us, but not until tomorrow morning. Tomorrow we pack up to head further east ~ 10 km. It will only be the 3 of us until we go back to S.C. to pick up Eduardo Palma on Friday.

Jon + I reset his second net from the west side of the banana grove to the north side, next to a large dead tree in a clearing.

17 June Shermans

garden line:

B-160 Rhipidomys? in dense shrubs along  
NK 23134 fence line

B-129 Proechimys = large + jumpy  
NK 23135 in shrubs along 2nd 20 trap line  
at along edge of pasture, on 20'  
from drop off to river

cover = 90% at shrub, 5% tree, 5% ground

Woods

685 Akodon same trap station as  
NK 23137 the Marmosa, trap 692

on 14 June

040 Akodon in dense cane grass  
NK 23136 + shrubs at edge of  
woods + overgrown pasture  
cover 60% ground, 80% shrubs,  
40% trees

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1991

M.C. Campbell

Los Lomitas

Journal

As we were setting the net we heard bat squeaks coming from the direction of the tree.

I heard them in & among the fruit trees as well.

We had help setting the nets. Some friends of the owner showed up to ~~eat~~ have a barbecue & drink in the little screened in porch kept just for that purpose. The owner, Romano Gentile (husband of Mary la Torre), didn't show, but the others had a good time. Two of the men came over to help us with the net. One, "Toto", seemed fairly knowledgeable about animals. He knew of Noel Kempf Mercado & his work on large mammals in Hanchaca. He is an air traffic controller. His friend, a fairly slick man I didn't like, is a pilot. ~~It is likely~~ I wouldn't be surprised if they have drug connections.

No bats by bedtime at 1:30.

17 June

~~At 1:30~~ Warm in a.m., with numerous clouds.

The last two days have been very windy, signalling a surasso? The wind comes from the north, northwest. It may rain.

Nothing in the Shermans across the river.

Four animals in my line:

1 Rhipidomys?

1 Proechimys

2 Akodon

4 of 1120 total traps ~ 3%.

121

Bats 17 June (a.m.)

- 1 Artibeus lituratus jamaicensis
- 1 Uroderma

in net by dead tree in  
orange grove

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Bolin's

1971

Las Lomas →

## Journal

No tucos in the traps this a.m. Hopefully we've caught them all. I took José Carlos to the micro stop while Frosty + Jon picked up camp. Before we left we all washed up in the river, as there is no water at Brecha Tres, our destination. The little sister of the ~~owner~~ wife of the caretaker came to talk to me, and told me that there were big "fish" she called "lagartos" which are abundant in deep pools during the rainy season. The river now is no more than 12 inches deep, averaging ~ 4 in. There are many little minnows in the shallow water which swim up to you out of curiosity. They have a particular fondness for dirty dishes, swimming into the pots themselves, which is how I caught two of them. I pickled both in 100% Form.

We were on the road by ~ 12:45, heading east. Brecha Tres is the name of the crossroads where we take our turnoff. Many Mennonites live in this area, ~~with~~ with farms to either side set well back from the highway. The site we are going to, 27 km S. Santa Cruz, was sampled by the Bolin's crew in 1988. The field belongs to Del Roldo Cardona.

We stopped at Brecha Tres and asked directions. Remarkably we were able to find him almost immediately. Don Cardona has moved, and now lives ~ 1 km E Brecha Tres along the main east road.

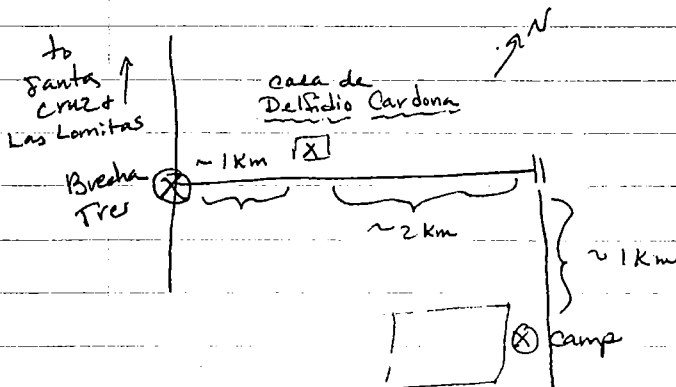
Bolin,  
1991

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Brecha Tres

Journal

He still owns the tucos field, and was happy to have us work there. He says there are fewer tucos now because of the cattle running on the property. Apparently cows compact the earth & make it unfit for tucos.



At our campsite the screened-in porch used in previous years is now a chicken house, so we camped in the cow pasture. The nearby yucca field has just been harvested, and there are few tucos. We set up camp in a fierce wind, with rain threatening. Our tents were not made to withstand Santa Cruz weather.

I cooked dinner while Frosty & Jon went off to set tucos traps. On his return Frosty saw an armadillo, possibly *Euphractus* because it was black. These are apparently common here.

Jon set 1 set of tucos traps. Frosty set 8 pairs. All traps were set in pasture which in 1988 used to be forest. It has been cleared for cattle, and still supports some tucos.

Moon at a little less than  $\frac{1}{2}$ , waxing. Fierce wind,  
Some ... + ... ..



27 km S Santa Cruz

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Bolivia

1971

Brecha Tres

Journal

18 June

Despite the wind last night we heard bats flying. We will set 5 more nets tonight.

We progressed all day, working on animals from Las Limitas. Frosty and Jon set more traps in the afternoon, for a total of 23 sets by the evening. One dead Ctenomys ♀ (pregnant) in the traps this morning. Another three in the afternoon + 2 in the evening, for a total of 6 Ctenomys today.

Jon set a bat net along the border of a field + woods to the east of us. There is a narrow band of woods along the road, then a soybean field (harvested) then thick woods. I wanted to set Shermans there but needed to stay in camp. Tomorrow I would like to set out a couple lines of Shermans.

Frosty saw a Sylvilagus brasiliensis while checking traps. At dinner time (~9:00 pm) the bat net check yielded another large Artibeus, <sup>jamaicensis</sup> despite the wind. The net also had become entangled in 4 diff trees because of the fierce gusts.

We prepped till midnight. The wind calmed down after 2:00 a.m.

19 June

Overcast + calm this morning. Soon after Frosty left to check traps we had a torrential

27 km S. Santa Cruz

M. L. Campbell

Bolivia

1991

## Journal

downpour. No bats in the net, which was again entangled.

We spent the day stuffing skins from last night. Frosty caught 1 Ctenomys in the morning. 3 other Traps were set ~~off~~ off. The tricos plug the hole for several feet after they discover an open tunnel, making it very difficult to dig down to their main tunnel to reset the trap.

In the afternoon I went off to set Shermans. Frosty showed me the fields behind the house where he has his two traps set. Apparently in 1988 most of the land here was covered in woods. Now there is only a thin strip of woods ~ 200 yds wide; all the rest has been burned off + converted to pasture. I set a line of 40 traps up the middle of the forest and another 40 along the ecotone between forest + pasture. Traps were set 10 paces (very rough - difficult to do in woods) apart, 2 per station; bait with oatmeal, vanilla, sardines in tomato sauce. I also set 7 Tomahawks <sup>front of</sup> in various burrows, probably armadillo, in both woods + pasture. Same bait.

Weather cleared in early afternoon. Sunny w/ some clouds, breezy. Moon at  $\frac{1}{2}$  tonight.

I heard monkeys in the morning + cigar's in evening, from woods to west and east respectively. ~~It~~ It is the same sound I recorded in Las Hornitas.

Bolivia

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M.L. Campbell

27 km S. Santa Cruz Journal

20 June

Jon + Frosty were up all night having fun -  
 el chickened out and went to bed around midnight.  
 They checked two traps in the wee hours of the  
 morning, and set a few more, with no luck. el had  
 much better success when checking my line of Shermans.  
 el caught a total of 18 animals of 4 genera:  
Calomys, Akodon, Bolomys?, and Monodelphis.  
 The Monodelphis species el believe is brivicauda  
 frontlets orange underparts. el caught both along  
 the edge of woods + pasture. elr all, 7 mice  
 were caught in the woods + 11 along the ecotone.

Trap results (Sherman) <sup>27 9</sup> 20 June:

woods	<u>Calomys</u>
	<u>Akodon</u>
	<u>Bolomys</u>
	<u>Monodelphis</u>
	<u>Calomys</u>

This is a much different habitat than  
 Las Lomitas, which is only a few kilometers  
 away. Not only are we catching different  
 genera of mice + marsupials, but the  
 tucoos here lack parasites. el thinks perhaps  
 it may have something to do with the  
 characteristics of the soil, since the tuco  
 digestive tract from here is usually full of  
 sand, unlike Las Lomitas.

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Bolivia  
1991

## Journal

The wind picked up again in late morning, turning into fierce gusts again by afternoon. The tent poles on both large tents are disintegrating. Jon set up 3 small dome tents, of which two additional poles broke. We finally decided to go back to town where we could prep in peace, considering our poor trap success with *Ctenomys* in the woods; saw a small reddish brown squirrel in the woods; uniform brown with reddish fringe on tail.

We finally decided to go back to town where we could prep in peace, considering our poor trap success with *Ctenomys* in the woods; saw a small reddish brown squirrel in the woods; uniform brown with reddish fringe on tail.

packed my camp, picked up traps and were on the road by night fall, carrying with us all the mice + one tree from yesterday to prep in Santa Cruz.

Arrived late + hungry. Dinner at the Bella Napoli ~ 11:00 pm, then to bed.

21 June

Heavy rain this morning. It is very good we left yesterday when we did, otherwise we might still be stuck in the mud somewhere on the road back to Santa Cruz. The street by the zoo flooded with ~ 2 1/2 feet of water.

In the afternoon Frosty went to pick up Eduardo Palma at the airport. Eduardo has been in Paraguay the last several weeks + is now ~~going~~ joining our expedition.

While Frosty was gone we received a FAX from Scott Gardner via Otto Jordan telling us we need to pay

Santa Cruz

M.H. Campbell

Journal

Bolivia

1991

car insurance today. Since we didn't receive the FAX until too late, we'll have to wait till Monday to pay it, delaying ~~our~~ our departure till then. I doubt we could have gotten out of here sooner, considering the number of animals to prep.

22 June

Prepped nice all day. Beautiful & sunny until late afternoon, when it clouded over again. Went to dinner with Emma in the evening, then to see Dances with Wolves.

23 June

Frosty, Emma & Darwin Vaca went out to Montero on the bus today to scout out the site. Jon, Eduardo & I stayed to organize gear & go shopping. Today is the Fiesta de San Juan so very few stores were open. Will have to buy many things tomorrow.

Frosty et al returned ~ 4:00 with 2 live ctenomy. They say there are tucos and it looks good for camping & trapping at Montero. Will leave tomorrow morning.

Overcast again in afternoon. Up late across from the zoo. Everyone in town it seems has a bonfire going this evening.

M. L. Campbell

Bolivia  
1991

## Journal

24 June

I had to go downtown and pay insurance on the truck this morning. It is truly incredible how no one in this country has change. At a well established business they had to send a girl out to get \$10 change on a \$100. They did not have 35 B in the office.

We packed up to leave today, but by the time we finished all errands and loading and were on the road it was 5:00 pm. We drove north out Avenida Benzer, passing the airport at Km reading 36. 4 km later we passed a 4 peso toll station, and then were promptly pulled over by the local police for inspection. The officer tried to tell us our brake lights weren't functioning & motioned us inside, but we checked the lights ourselves and they were working fine. They let us go after that. I suppose a loaded truck full of foreigners is a prime target for harassment.

At km 70.5 (our truck odometer) we took a left turn onto dirt road, and then promptly veered left again. We continued down a dirt road until <sup>km</sup> 72.5, when we arrived at the ranch of Don Chano, our destination. The ranch/farm is on the right side of the road. We entered a gate just beyond the house and drove to a small thatched shelter in the pasture, where we set up camp. It was a good thing we didn't try the road in two days.

Bolivia  
1991

M.L. Campbell

Montero

Journal

ago, as even today we barely made it through several deep muddy holes in the road. Hopefully they will dry out some more before we have to go back in to Santa Cruz.

Emma Luna came out with us, and Darwin Vaca joined us after taking the bus after work. Both need to return to Santa Cruz early tomorrow morning. On arrival Jon + Emma went off to set bat nets near the house; Frosty went to set tuco traps, and Eduardo + I set Shermans. I set a box of 40 traps (1 broken = 39) in overgrown pasture to the southwest of camp. The vegetation was ~ 1-2 meters high, dominated by shrubs, grass and composites. My line ended near some larger trees. Eduardo set another line of 40 along the ecotone between corn + sugar cane field and an ungrazed area of dense brush + small trees. Bait with oatmeal, vanilla, 3 sardines in tomato sauce. My traps were set 2 per station, 10 paces apart. Eduardo set 1 trap every 5 <sup>long</sup> paces.

When Darwin arrived both he and Jon set additional tuco traps. Eduardo, Emma, and I set up camp. Darwin brought back the first tuco, a live *Ctenomys*, at ~ 9:00 pm.

Moon nearing full, very bright. Clear + calm.

25 June

Nothing in my traps this morning. Eduardo caught 10 animals, all along the border of ~~the~~ dense thicket. There was an *Artibeus jamaicensis*

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Bolivia  
1991

25 June

Montero

Journal

in the nets. Between 9:00 pm and 1:00 a.m. last night  
~~3~~ <sup>3</sup> more *Ctenomys* were caught. This morning

• Frosty brought back another 2 animals.

Our locality here is 3 km SE Montero,  
1 km N Villa Copacabara, Santa Cruz. el. 250 m.

Our camp is set up in rarely grazed pasture  
 full of 2-3 feet high termite mounds. In the  
 vicinity are several different stages of secondary  
 growth, from shrubs filled overgrown pasture still  
 being grazed somewhat to a dense thicket of  
 low trees/ungrazed to forest of tall trees to the  
 south, which I have not explored yet. There are  
 also sugar cane & corn fields.

We spent the day prepping. Don Chano,  
 the owner, came by midmorning to admire  
 our camp & etc. He is very pleased we are  
 catching tuco. He says other animals here  
 include: tati, g-quincha, hurina, zorro  
grande, gato pintado, taipeti, carachupa, and  
comadreja. He has a pet deer which  
 died recently. There are three more for sale  
 in Montero, he claims. He also says a  
 neighbor has a cat skin we could possibly  
 obtain.

In the afternoon Frosty met some people  
 who live nearby who want us to come catch  
*Ctenomys* on their property. They live farther north,  
 near Concepcion, and have a house down the road  
 here in Montero. They say they have both large



Trap results 26 June

{ 632 Bobomys <sup>Akodon</sup>  
 { B-77 "

caught together in  
 same trap station  
 in 2nd line; 100% cover  
 of shrubs, vines, + grasses  
 ~ 1-2m in height. On  
 thin strip of dry ground;  
 at ~ 100ft north and 50ft  
 south the lower ground  
 is flooded with w/in of  
 water, forming a temporary,  
 rain filled marsh.

pulled all my traps  
 Eduardo's still out

Bats 25 June pm check

1 Stornira sp

1 Phylloderma?

26 June morning

2 Uroderma

1 Artibeus jamaicensis

from nets in  
 banana grove

Frosty saw Sylvilagus brasiliensis

Emma caught a Liotropis semicinclus

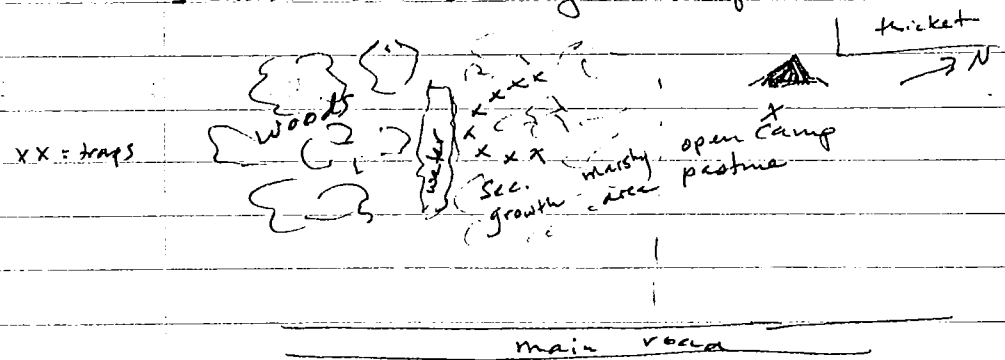
Bolivia  
1991

M. L. Campbell

Montoro Journal

and small stenomys on their property, possibly C. boliviensis & C. steinbachi in sympatry.

We spent the day prepping. Clear & windy, winds from the northwest. In the afternoon I went to set another 40 traps. I wanted to get to the woods to the south of us, but there was a water & mud filled swamp barring the way. Instead I set traps in heavy cover of secondary growth ~ 2 meters in height, a virtual thicket of small trees, grass, forbs & shrubs. Cover virtually 100% from 2m down.



Traps were set in a narrow band of denser vegetation on higher ground. Approximately 100' S & 50' north the topography dipped to form a marshy area, in each case filled with low grasses & ~ 1 in of water with occasional deeper pools (south).

~~...~~ Darwin, Emma & Maria Dolores arrived in the evening.

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Bats 26-27 June

*Artibeus jamaicensis*

→ *Uradema bilobatum*

*Glossophaga?*

M. L. Campbell  
Bolivia  
1991

Tarija Trip Journal

3 July Left Santa Cruz today for our second transect to the vicinity of Tarija. Despite having everything already packed it took us till 2:30 to get out of town. The crew this trip consists of the following people:

- Dr. Syd Anderson of the American Museum
- Dr. Terry Yates of NSF + MSB
- Dr. Scott Gardner of UC Davis

- students:
- Emma Luna Pizarro of Santa Cruz
  - Lila Alejandra Sáenz Bacherer "
  - Sandra Gladys Rocha ~~Olivia~~ Olivio La Paz
  - Amparo Maria Lucero Sáenz "
  - Angelica Maria Nuñez Quiroz "
  - ~~and~~ Santiago Garcia Herbas of Cenetrop
  - ~~and~~ Jorge Salazar Bravo of La Paz / UNM
  - Marcel Campbell of UNM / UC Davis

We drove ~~south~~ west on the route to Cochabamba and then took a left turn on the road south to Argentina. This is an area Terry et al have been to previously. We continued down the dirt road with only one minor incident of almost getting stuck until ~ 5:00pm, when we stopped to make camp. Scott made ~~a~~ a verbal road log. We camped at Hacienda El Pelicano, a small farmhouse opposite the railroad tracks. The forest here has all been cleared for ~ 1/2 mile in every direction. The field closest to the house has been burned, and

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Zanja Honda  
Hacienda Pelicano

Journal

3 July cont is regrown with ~~fresh~~ tall grass ~ 1-1.5 m.

I didn't see any evidence of cows or use of the pasture for grazing. Approximately 1/4 mile east is a small patch of woods no more than .30 m wide, bisected by a road & heavily cut over. The remaining trees are a mix of legumes & broad leaved species. Many have epiphytic Philodendron growing high up on the trunks. The trees appear fairly young, ~ 30 yrs old?, no more than 1 ft in diameter. Bigger trees have been

removed, and I saw mahogany trunks already cut & ready to ship out. To the east of the woods the trees have all been knocked down by bulldozer for at least a mile, but it has ~~not~~ not yet been burned.

I set a line of 40 traps with Santiago in the thin band of trees & along the border with the (burned) pasture. Traps set 2 per station, 10 paces apart. Bait with oatmeal, sardines, vanilla.

Total traps out this evening:

MLC/SGH	40
JSB/SGRO	40
TLY/SLG	18
EP/ALS/ANQ	39
LASB/ELP	46

183 traps

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Zanja Honda

El Pelicano

Journal

3 July cont

Moon rising late, at  $\frac{1}{2}$  waning. Several hours of dark with brilliant stars. Walking back we setting traps we heard animals scurrying off into the dense grass every few feet.

4 July

Clear this morning with dew. Many animals in the traps. Most were caught in or along the pasture in dense grass. Moon at  $\sim \frac{1}{2}$  waning.

Trap results 4 July:

MLC/56H 9 Calomys

2 Akodon

EP/ALS/ANQ 12 Calomys

1 Akodon

LASB-ELP 2 Marmosa

1 Akodon

SRO/JSB 15 Calomys

1 Akodon

TLY/SLG  
KAP/LSH

2 Calomys

1 Rattus

24  
183  $\overline{)450}$   
366  
840  
732  
1080

$\boxed{45}$  animals of  $\boxed{183}$  traps

4 genera

$\boxed{\sim 25\%}$  success

There are at least 2 species of Calomys.

We packed up camp and the animals & headed south again. We would like to get close to Caimiti this day. It was surprisingly chilly on the road, with a cool wind from the south, but the sun was fierce when we stopped. On the southern horizon we could see a cloud front.

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Estancia Isibobo Journal

4 July

cont

We drove all day through hilly country, passing occasional very small villages. The road continues to be dusty + rough. Near Estancia Isibobo we stopped for the night after making a turn off the main road to a road less travelled. This area is dry thorn forest similar to the area around Parvenir, Chuquisaca, according ~~to~~ to Scott. Both places are on the edge of the Chaco, but still in fairly hilly country. On the way to our campsite we passed several rock outcrops, but our camp is pitched in flats in deep pale sand/dust. The predominant trees are Aspidosperma, Taborochi (Bombax), Prosopis, and several others I don't recognize. They are filled with Tillandsia + a type of Spanish moss. The trees + shrubs form a fairly sparse thicket of spiny branches. On the ground numerous hooked bromeliads + cacti make walking difficult. ~~Passiflora~~ There are also occasional columnar cacti. This is a deciduous woodland + the ground is covered with dead leaves.

This locality is 1 km S. and 3 km W.

Estancia Isibobo, 930m 19° 31' S 63° 36' W.

We set out traps on arrival. Sandra and I set out 36 traps into the brush behind camp. Traps set 2 per station, 10 paces, bait w/ oatmeal, sardines in tomato, vanilla mix.

Trap results 5 July

Clear, with some dew, ~10° last night + humid  
MLC/SRO : Line of 36 traps

MH 34

Geomys along  
fallen log in fairly  
sparse cover of shrubs &  
(30% at 1-1.5m), trees  
(Legumes + ?, 60% at 3-10m)  
forbs & grass, cactus +  
bromeliads (40%)

~~Prosopis~~  
Prosopis  
Acgidozperma

Much dead wood & fallen  
branches

Trees with Tillandsia epiphytes,  
lichens

Many holes of cania size  
animals; some of the bromeliads  
have had their soft parts  
eaten as if by a squirrel

Total trap results 5 July

MLC/SRO 1 Geomys  
ELP/LASB 2 Micromys  
monadelphus

3 of 139 traps

~2%

139  $\frac{.02}{13.0}$   
278  
2.10



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Journal

Total Traps out 4-5 July

MLC/SRO 36

EP/SGH 40

ALS/ANQ 23

LASB/ELP 40

SRO-LASB-ELP 5 Tomahawks

139 + 5 Tomahawks  
Shemens

Terry, Scott, Jorge + I also set a bat net across the side road where we are camped. We heard high pitched clicks in the evening, which could be bats, birds or insects.

We didn't set up the lab because we want to go reach our permanent (3 day) camp first. Moon rising late, waning. I saw some interesting termites in the road; a hole opening straight up with the large soldiers standing guard. Despite their watch a wolf spider was eating one of their companions. I went to bed early as I've not been feeling well. As I was getting ready for bed I heard a hoarse call which may be a fox. Scott also heard it & I'd ID'd it as a fox.

5 July

Many birds singing this morning. Up early to check traps. Results from my line are on opposite page. Emma + Lila also caught 1 Miconseus and 1 Monodelphis (dead).

No other captures.

5 July cont  
Cañiniri  
→ Boyquibe

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1991

We left at 9:00 after packing up camp. Again, Syd has the road log of the day. We travelled south through hilly dry forest, reaching Cañiniri ~ 12:00. We went shopping for meat, bread, soda etc on arrival. Terry actually found ice for the cooler. Cañiniri is a surprisingly large and well kept town, but with many parking regulations.

After lunch we went to talk to the military post in town. We have a letter from some high level military official explaining our expedition & asking for cooperation from local officials. They were very helpful, taking our passports, our names, & offering to their radio frequency should we have any trouble & need assistance. The latter offer is very <sup>valuable</sup> ~~helpful~~, so Scott bought a ham radio we can use to contact someone in case of emergency.

We left Cañiniri by 2:00. Our destination is somewhere along the border between Santa Cruz & Tarija on the edge of the Chaco plains, preferably somewhere east of Boyquibe. From Cañiniri I think it is ~ 68 km to Boyquibe, and from there another 100+ kilometers to the border with Paraguay.

We reached Boyquibe late, ~ 4-5 pm. We reached the edge of town and were held up ~ 30 min by the police guard station, as apparently Scott's license card had some errors regarding vehicle & engine Id. The guard wanted to check all numbers to make sure we weren't taking a stolen vehicle to Paraguay.

5 July cont.

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Cuzimiri →

Journal

He also took everyone's name & ID or passport numbers. ~~and~~ <sup>He</sup> told us the road from here out was terrible ~~and~~ <sup>and</sup> that we should burn bonfires & set guard every night because of the "tigres." The road was so bad, he said, that our truck would never make it through the 3 foot deep sand. We finally were allowed to leave, drove another 500m, and were stopped by the military guard station. They also wanted our names and passport numbers, which meant more waiting. The young soldier at the gate ran up to us initially, waving his machine gun. We are probably the most exciting thing to happen all month. ~~Before~~ They told us the road was fine and that they drive it every couple of days. After another 20 minutes we were finally allowed to leave.

Approximately 5 km out of Boyuibe we saw a skunk run across the road. Terry chased it down and shot it, a Conepatus chinga. At the same place we saw numerous fresh wounds of a large tree tree, possibly Chenopodium conoideum. The soil here is pale sand/silt, with Chaco vegetation.

We continued on well past dark, passing through hilly country and finally down into the flats. We made

Trap results 6 July

ptly cloudy last night, slight breeze  
Calm in a.m., high clouds, clearing.

Monodelphis

JB 16 ~~Mammosa~~ <sup>sp</sup> in clump of ground  
dwelling bromeliads in  
station 11 open area under sparse  
cover of shrubs (20% at 2m)  
and trees (5% at 3-5m).  
Columnar cacti within 20m.  
Trees hung with moss, Tillandsia.

Thylamys

687 Mammosa sp. 2 At base of  
burned tree in open area  
station 20. (20% at 2m)  
of shrubs + some grasses +  
forbs (~5%). Trees < 0%.  
Dead wood.

Aspidosperma quebracho blanca

Total animals 5-6 July

MCC/SRD/ALS	2	1 Monodelphis 1 Thylamys
ELKAA/ALSB	2	1 Graomys griseo flavus 1 Calomys callosus

Bolivia  
1991

5 July cont.

M.L. Campbell

Boyui'be →

Journal

camp ~ 53 kilometers E of Boyui'be in flat Chaco habitat. The Paraguayan border is approximately 80 km E.

We arrived in the dark + set out traps. Sandra, Amparo and I set two parallel lines of 40 + 39 traps with traps set 2 per station, ~ 10 paces apart. The lines headed south, southwest of camp in a not very straight line, as we discovered the next morning. The lines ranged from 30 - 50 paces apart. Bait with standard bait of oatmeal, sardines in tomato, + vanilla. Emma Luna + Lila Alejandra also set out traps, two lines of 57 each paralleling each side of the road to the west of camp.

Total traps out 5-6 July

MLC/SRO/ALS 79

EL/ALSB 114

193 Shermans

Clear with some dew. Moon rising late, waning. Cool enough to be cold on the way in riding above on the truck.

We prepped animals till late.

6 July

Up early to the sound of bird calls. There are many tracks in the dirt road, possibly fox + cat. Trap results from this morning are on opposite page.

Total traps out 6-7 July

ELP/LASB-ANQ	114
MLC	40
SRO/ALS/ANQ	39
MLC/SLG	<del>80</del> 78
EP/JSB	117
LASB-ELP	<u>9 Tomahawks</u>
	388 + 9 Tomahawks
	Shermans

Marcel L. Campbell

Bolivia

1991

6 July

E. Boyliffe

Catalog

It appears that we have a different Grammys here than at our previous locality. At Est. Isibobo we caught a specimen which differs from the present one in having a <sup>more</sup> sparsely haired vs. bushy tail, rel. shorter tail, and grey/white vs. white belly. The former is probably Grammys domorum, the latter probably Grammys guineoplus. The latter species is what we commonly caught in the Chaco ~~to~~ Monte in Argentina in 1990.

We spent the day trapping once again. Several people were infested with ticks (seed ticks = garapatillas) this morning, but we doused them with heavy doses of nasty chemicals. There are many cows & cow trails here, thus the ticks.

In the afternoon we set out the rest of the traps not containing animals.

Eduardo & Jorge set out an additional 117 traps to the east of camp; Scott and I set 78 traps out ~1 Km W + 1 Km N of camp at a cattle pond surrounded by Baccharis (chilca dulce) & other shrubs.

At the cattle pond I set a line of 39 in ~~the~~ ~2-3 tall Baccharis along the water edge. Cover 0% at ground, 0% trees, 70%-80% shrubs. Scott set 39 traps above me ~~at~~ in lower shrubs

6 July

E.  
Boynise

Marcel L. Campbell

Journal

Bahia  
1971

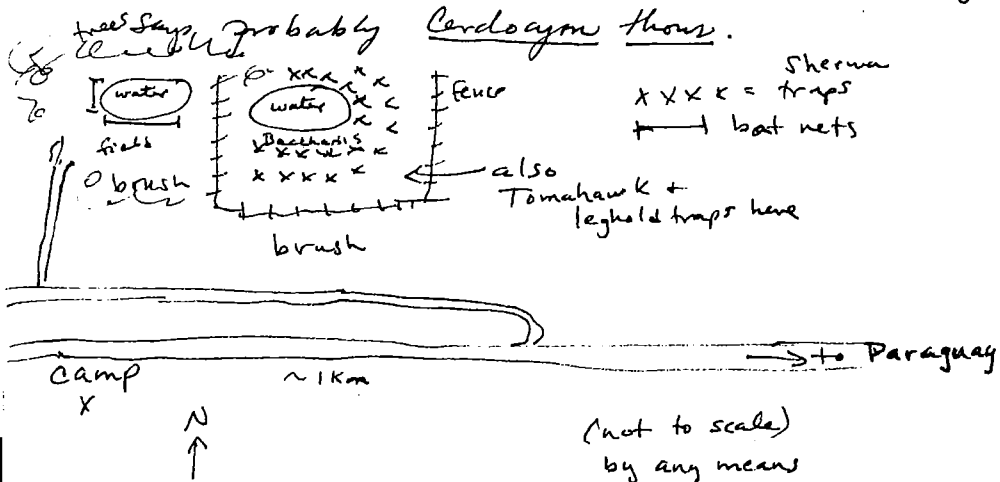
at the edge of the Baccharis thicket. The ground here was heavily eroded with little cover except under the scattered clumps of bushes. Traps were set 1 per 5 paces.

Scott and Terry had set 5 Tomahawks at this same place while scouting around in late afternoon. They also set 1 leg hold trap. They had talked with the owner of this property earlier. He lives ~ 10 km E. He has a small deer skin drying in the pen by the cattle pond. His name is Luis \_\_\_\_\_

Emma + Alejandra also set 9 Tomahawks along their trap line by the road at camp.

Scott, ~~Colbert~~ Lila, Emma + I set a ~ 12 m bat net along the south side of the second cattle pond, another on the west side. As we were setting the nets bats were flying all around us, but none flew into the net.

On the way back we saw a small, squat short-legged fox run across the road. Syd





6 July

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Bolivia  
1991

E. Boyzibe

Journal

We ended up not prepping at night - only a couple of skins. We ~~to~~ will finish up tomorrow. El went to bed early as el am coming down with a nasty cold. Scott tried all evening to reach Huanchaca or the States with his radio, with no luck. We did talk to a person in Sucre, however, who said our signal was coming in loud & clear.

7 July

Clear this morning, and calm. No bat in the nets. Scott et al checked them last night after el went to bed, but they were empty. They took down the 12' net on the south side of the pond, leaving only one net up.

el & Scott's & my trap lines by the pond we caught 2 Calomys callosus each, for a total of 4. No other animals on any line.

Trap results 7 July

MLC/SLG [4] Calomys callosus  
of [389] traps total  
≈ 1.2%

Nothing in Tomahawks or leg hold traps.

Scott ~~say~~ <sup>and</sup> el saw a cuise after picking up traps by the pond. el was eating a root unperturbed within 8' of us. el ~~was~~ ran ~~to~~ when Scott approached it with a stick. el thought it was Microcavia, but Syd says there are no records of that genus for Bolivia.

E. Boyzice

M. L. Campbell

Bolivia  
1991

7 July

Journal

Galea musteloides apparently is the common cuise in Bolivia.

We prepped all animals in the morning. In the afternoon a decision was made to send a crew back towards Boyzice in search of Ctenomys. Terry, Edwards, Emma, Lita, & Santiago agreed to stay the night ~~at~~ at the new camp, taking the lab with them to prep lucas. Scott & Jorge took them off an hour's drive to the west of us where they found tucos mounds, made camp, and set traps. Scott & Jorge then returned to camp. We will pack up here & go out to meet the others tomorrow morning.

Edwards took 120 traps to set for marsupials to the east, where he may have better trap success (in the hills vs. plains). We will not quite reach 1000 trap nights this locality.

Ayd & I went in the afternoon to set Cori'bear traps for cuise at the cattle pond. We set 12 traps in shrubs along the edge. We also took the shotgun but saw no animals. Before we returned we lowered the bat net, ~ 5:15.

This morning Terry saw a small deer, ~~also~~ while walking the road. Jorge also saw one in the afternoon with Edwards, while picking up EP's 120 traps. Both were probably Mazama gouazoubira.

7 July

Marcel L. Campbell

Bolivia  
1991

E. Boyuibe

Journal

Sandra, Angelica + I set 66 traps remaining in the brush to the west of camp. Traps set 2 per station, 10 paces, 1 line. 40 of those traps were from Scott's line by the pond, which he had pulled this morning.

Total traps out 7-8 July, 53 Km E Boyuibe

MLC 40

SRO/ALS/ANQ 39 } by camp

ELP/ALSB 114 }

MLC 37 (by pond)

MLC/ALS/SRO 66 (by camp)

296 Shermans + 13 Tomahawks  
+ 1 leghold.  
+ 12 Canibear

At twilight a bat flew out the forest to the west of us + spent several minutes flitting about camp above the tents. It looked like a medium-sized molossid to me, but Syd ID'd it as a Myotis. It was maneuverable, so probably it was the latter. We heard many bats later.

Scott + Jorge returned at 7:30 pm. We checked the bat net + found 2 small  
~9:30 molossids, possibly Molossops temmincki.

They were both pale brown, almost golden colored.

One other event of note: Syd + I found a flattened Euphractus carapace on the road to the cattle pond in the afternoon. It was old + dried - Syd took the head as a record.

8 July M. L. Campbell Bolivia  
E. Boyuibe Journal 1991

8 July

Trap results this morning: (~~clear~~ <sup>calm</sup> + clear), chilly  
my line of 40 behind camp:

MH 41: Graomys in same clump  
of bromeliads, in same trap  
that caught the monodelphis  
2 days ago.

Sandra/Angelica/Amparo's line parallel to mine:

1 Thylamys

1 Graomys griseoflavus

On line of 66 to the east of camp:  $\emptyset$

Emma + Lilao's line of 114 along road (checked  
by Jorge + Amparo):

1 Graomys

---

my line of 38 by cattle pond:  $\emptyset$  in Sherman's  
1 Galea musteloides in  
Conibear trap.

Total captures 8 July; 53 km E. Boyuibe

Graomys griseoflavus 3

Thylamys cf. elegans venusta 1

Galea musteloides

1  
5 animals

+ 2 Molossops tomiccki = 4 of 296 Shermans  
from last night.  $\sim$  1.4%

5 birds in net this a.m.  
no bats.

+ 1 of 12 Conibears

8 July

M.L. Campbell

Bolivia  
1991

→ 26 km E. Boyuibe Journal

Left camp 11:22 at km 3029.7.  
At 3045.1 11:44 we hit the hills.  
900m highest elevation vs. 500 in flats.  
Much woodcutting in lower areas/flats. We  
drove out onto the flats and found the newly  
established camp at 26 km E. Boyuibe as  
the crow flies. This area is much more  
heavily trampled by cattle than our previous  
locality. There is very little ground cover  
except in the occasional dense mats of  
bromeliads.

Terry, Emma, Zila + Eduardo had  
not yet caught any tucos. The species  
here is probably Ctenomys conoveri, and  
is too large for macabee gopher traps. They  
caught 2 Grammys griseoflavus in Sherman  
traps (17 total). In the morning they  
were awakened by a truck full of soldiers  
shouting @ "buenos dias" and shooting  
a 45 into the air. They wanted to know  
why our crew was camped out in the  
middle of nowhere. They left without  
further hestling.

We set all the remaining traps (Shermans)  
Scott, Terry + I took 120 traps + set them  
on the north side of the road. TLY + SLI  
set a line of 80 along the fence line + I  
set 40 traps to the east, into the vegetation.  
My traps were set 2 at a time @ 10 paces; their

8 July

Marcel L. Campbell Bolinix  
1991

26 km E. Boyuibe Journal

traps were set 1 per 5 paces. The vegetation here is much more sparse than further east. It had trouble finding cover to set traps in every 10 paces as the trampling by cows was so severe. The dominant vegetation was

trees of Prosopis, Angiosperma, Cercidium, Acacia, columnar organ pipe cacti, Opuntia, and many scrubby oak-like trees. ~~at least 10~~

On the ground are occasional large clumps of bromeliads full of Galea runs, scattered small cacti, fallen tree cactus trunks, dead leaves from deciduous species etc. In

many ways this habitat reminds me of the Florida sandhills, with turkey oak + palmettos. I'm not sure why.

Total traps out this evening:

MCC/TLX/SLG	120	+ 13 tinco traps (TLX, SLG) (only 5 steel traps)
SEO/ANQ/ALS	78	
ELP/LASB	90	+ 11 tinco traps
EP/JSB	120	
	<u>408</u>	Shermans

In the evening we prepared animals. On checking traps in the evening (tinco) Terry caught a Ctenomys conoveri in a steel trap. It was huge. No wonder they haven't been caught in the gopher traps.

We saw many molossid-like bats flying at dusk. Scott shot at one

Bolivia  
1991

8 July

Mariel L. Campbell

26 km E Boyuibe

Journal

and missed. Sky clear; Scorpio in the milky way. Moon a sliver, almost new.

Santiago caught 4-5 Triatoma in the afternoon while checking two traps. Two of them bit him. In the evening while working in the lab several flew into the light. We kept our tents tightly closed. It is possible the species here carry Chagas disease.

9 July

Up early this morning. Still clear & beautiful. Fairly cool last night.

I caught a Graomys in my line of 40, and saw a Galea in the bromeliads.

Total animals this morning:

408  $\frac{.0}{8.00}$

MLC	<u>Graomys</u>	1
EP/ISB	"	2
SRO/ALS	<u>Graomys</u>	2
	<u>Calomys</u>	1
ELP/LASB	<u>Graomys</u>	2

$\frac{18}{408}$  animals of 408

< 2% traps

+ 1 Ctenomys conoveri from last night.

We prepped animals & then packed up camp. We were on the road by 2:30.

We headed ~~west~~ east to Boyuibe, but headed south toward Chuguisaca before going thru town, again paralleling the railroad.

9  
8 July

M.L. Campbell

Bolina  
1991

Camatindi.

Journal

Again, Syd has the road log. We climbed up out of the flats into hill country, with taller trees (10-15m average) ~~and~~ forming a real forest, though still containing many species from the flats, eg toborachi, so to, mesquite, acacia, etc. There ~~was~~ was much thicker vegetation at shrub + ground level as well. Eventually we began to see the pink flowers of the tajibo tree, characteristic of this hill country + higher elevations.

~~So~~ We passed the turnoff to Porvenir, Chiquisaca, where Scott, Joe, Terry et al collected so many Marmosa + Monodelphis in 1985. In this type of habitat apparently the marsupials are ~~now~~ the dominant mammals.

At ~4:30 we passed through Camatindi + made camp along the river bank just south of town. Camatindi is a small Pueblo, but we were able to buy cold beer.

The river is only a few inches deep, but ~~is~~ forms a river bed ~150-200' wide. To the west rise forested hills, to the north is the pueblo.

We set traps on arrival. Santiago + I set 80 (actually 79) traps in the vicinity of camp. 60 traps were set in a narrow band of low forest between the camp clearing + the river bed. The remaining 19 were set to the NW of camp between the clearing + ~~at~~ the base of a hill,



9 July  
Camatindi

Marcel Campbell

Bolivia  
1991

Journal

Total traps out 9-10 July (Camatindi)

MLC/SGH	79	
EZP/LASO	80	+ 5 Tomahawks
SLG/TLY	<del>79</del> 80	
JSB/EP	80	
SRO/ANA	60	
	<b>378</b>	Shermans + 5 Tom.

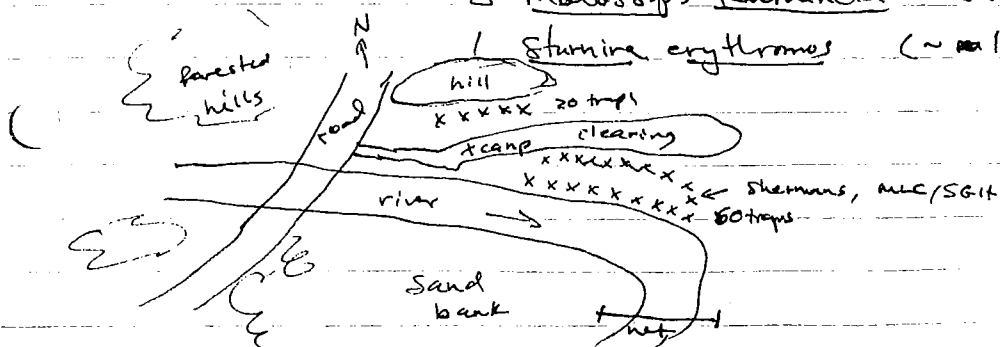
Amparo & Angela also set a bat net across the river. We heard bats flying all over, and I could see them in my headlamp diving down to the water to drink. As soon as the net was up it caught 3 Molossops temminckii.

I washed my clothes & myself in the river after dark. I stopped using soap in the water after I realized there were numerous toads breeding along the shore. I collected one of them, as well as another small Rana, a male cricket, and several small (1-2cm) catfish. The bed is sand with a few pebbles, water 1-5 inches deep.

Bats caught this evening:

3 Molossops temminckii (sunset)

1 Sturnira erythronus (~ 10:00)



Camatindi

M. L. Campbell

1991

Journal

Trap results 10 July

ptly overcast, dew, calm. Feels like rain.

line of  
20

B-96

mic

Marmosa on trunk of bent over tree ~ 1m above ground in narrow band of forest between road + river. <sup>in hills</sup> Trees at 10-15m high, cover 60%; shrubs at 2-3m, cover 70% ground cover of small forbs legume forest, primarily, but <sup>(viparian)</sup> fairly wet. Armadillo holes in hillside.

line of  
60

569

SOH

Marmosa on ground at edge of forest ~ 20' from sand of old river bank / clearing. Trees at 10-20m, cover 80%, shrubs at 3-4m, cover 70%; ground cover 30-40% of small forbs, dead leaves. much fallen wood.

mic

B-167 (60) Marmosa on ground at base of fallen trunk in same habitat



10 July

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1991

Camatindi

Journal

10 July

Overcast this morning. We picked up traps early because we're so close to town.

My trap results are on opposite page.

Total trap results 10 July:

SLG	9	} edge of old yucca field
TLY	7	
MLL/SGH	3	Marmosa
JBB/EP	1	Oligoryzomys
SRO/ANR	—	
	<u>20</u>	of <u>378</u> traps ~ 5%

On the bat net there was a drowned Noctilio and a large molossid, Nyctinomops.  
(Both really neat!)

We packed up camp and were on the road by midmorning. It was still overcast, and fairly cool. We arrived in Villa Montes ~ 11:00 + went shopping. We were again able to buy ice and good meat, although we almost missed the latter as stores were already closing for "siesta". We received the usual "Oh, come back at 4:00" when we asked for directions to meat shops. We also tried to get to a mechanic after lunch with no luck.

We left after lunch + headed west into the mountains. The road passes by the Rio Pilcomayo, a large river coming out of the Andes. It is a major source of fresh

Policia Boliviana Transito

after bridge; Villa Montes

Transito Ruta Tarija Yacuiba 157 km

Prohibido la caza deportiva de charater

quirquincho, corzuelas

centro de desarrollo Forestal

Villa Montes  
→

Marcel Campbell

Bolivia  
1991

Journal

10  
July

fish such as surubi. ~~and~~ We saw numerous groups of fishermen in boats with large seines. The overlook from the road is deadly: it is a sheer drop of several hundred feet to the water.

We continued on through a spectacular gorge formed by the river, on a windy + narrow highway (dirt of course).

The road then headed south through hilly Chaco vegetation, with *Prosopis*, *Acacia* + columnar cacti.

We climbed up over a pass of ~ 1000 meters in elevation but found no place to camp. Near dark we ~~had~~ finally found a campsite, but at only 800m. We decided to stay since there were *Ctenomys* burrows in the vicinity, rather than trying to climb higher in the dark.

Emma, Alejandra, Amparo, Sandra, Angela and Jorge, Eduardo and I set traps while the others set up camp + the laboratory.

Total traps out 10-11 July

MLC/ALS 79

EP/JSB 80

SRO/ANQ 78

ELP/LASB 80

[3, 2] Shermans

11 July

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1991

Palos Blancos

Journal

Trap results 11 July MLC/ALS

Overcast, cool, very still. Trap check 7:30.

B-170 Graomys at the base of a <sup>cactus tree</sup> ~~tree~~ at foot  
of west facing slope of hill; <sup>slope ~ 20°</sup> sparse  
ground cover of dead leaves, low shrub/  
forb layer at ~ 30cm, cover = ~ 10%  
(most deciduous + without leaves); tree  
cover (all without leaves) = 60%, dry  
legume dominated hilly chaco thorn scrub.

ABC 69 Marmosa next to small mouse hole in  
north facing hillside of slope ~ 60°;  
~ 60' above wash below. Sparse cover,  
with trampling by cows. \* Sapling Angiosperma  
immediately adjacent, cover at ground < 5%  
(dead leaves, dirt); shrub level = 15-20% (1 meter)  
tree level = 50% (3-4m). Columnar cacti  
within 15'.

Tarija:

2 km S. + 5 km E Palos Blancos 800m

21° 26' S, 63° 44' W

10<sup>th</sup> July

Marcel L. Campbell

Bolivia  
1991

Palos Blancos

Journal

Terry, Jorge + Scott set tuco traps. The holes for the burrows are much smaller - probably not ~~the~~<sup>C.</sup> conoveri.

Amparo's my trap line was set to the south of the road along the base of one hill and up the next. This is dry, legume-dominated forest ~~is~~ reminiscent of our campsites to the east but ~~richer~~ with more Diels + fewer bromeliads. Traps set 2 every 10 paces. We saw many large open burrows, possibly Gel.

Scott + Terry started calling this our "squalid" campsite because of the numerous small spring grass seeds which have entered everywhere in clothing + tents, and because we are camped adjacent to a gas pipeline. They also <sup>(possibly leaf cutter)</sup> saw numerous army ants, and the rest of us came back covered with seed ticks. We will leave tomorrow unless we catch something spectacularly interesting.

No tucos in the traps as of late evening. We spent the evening prepping, staying up late to finish. It felt good to be getting some work done. All our frequent travelling has left us feeling a bit displaced. We need to get our permanent (3 day) camp set up.

11 July

Some light sprinkles of rain last night. Overcast. My trap results are on opposite page.

11 July

Marcel L. Campbell

Bolivia

1991

Palos Blancos

Journal

Total animals this morning (11 July)

MCC/ALS	2	<u>Gromys</u> / <u>mammosa</u>
JSB/EP	1	<u>Salpa</u> <u>musteloides</u>
	<u>3</u>	of <u>317</u> traps = ~1%

The Gromys is very large, with a white belly. Probably gusciferus.

We pulled traps + picked up camp, on the road by ~11:00 a.m. Shortly after getting everyone into the truck Scott discovered that the accelerator cable was stretched loose. Yesterday we had had trouble with not enough power to the engine; this was the reason, we discovered. They fixed it + suddenly we had an engine response to depressing the gas pedal.

A few kilometers down the road we crossed a small riverbed and arrived a Palos Blancos, a cluster of little houses.

As we climbed the vegetation gradually became taller + denser. By the time we hit 1200 m the vegetation looked ~~more~~ much more "Yungas" than "Chaco", although some Chacoan elements persist, such as columnar cacti and leguminous trees. There are many broad-leaved species, especially of shrubs (one that looks like Palo Diablo but without the ants).

We made camp at 1500 m exactly, in the cattle pasture ~~of~~ next to a house (mud). To the north + south of us ~~hills~~ forked hills rise



11 July  
Tarija:  
Tapecua

Marcel L. Campbell

Bolivia  
1991

Journal

steeply. Directly across the road is another house with cut over pasture, but behind us is forest. I imagined the forest in the vicinity of these house had been fairly heavily impacted by cows + pigs, both present, but I think the impact is fairly localized.

We are at Tarija: Tapecua, 1500m, 21°26'S, 63°55'W. We set up camp + then dispersed to set traps. My line of 50 Shermans begins ~500 ft down the road (west), starting in a ravine ~20' below the road and continuing down the ravine along a steep (~60°)

This area reminds me of the

Appalachians; forested slopes; little ground cover except for dead leaves + some forbs; good canopy; steep slopes; + some large rocks

SE facing slope. There are many rocks in the ravine, and much fallen wood everywhere.

The ground has a good 4-5 inches of leaf mulch + litter on the surface, ~~plus~~ ~~the~~ ~~same~~. The trees form a good canopy (~60-80% cover) at 20-30'; shrub layer (30-50%) is fairly sparse on sides of the ravine but dense down ~~into~~ inside, with many small branches that snag hair + clothing. There are numerous vines to climb over + through as well. A few small forbs, ferns etc form the ground cover of <5%.

We arrived in mist, and it began to sprinkle almost immediately. Setting traps in the fog, rain, mud + dark on a slope

11-12 July

Marcel L. Campbell

Bolivia  
1991

Tapecua

Journal

was difficult, especially after my light broke. But we arrived back at camp to a blazing fire and a wonderful dinner of tenderloin, mashed potatoes, and chile w/ onions. Yum.

Scott set up his ham radio in the evening and tried to reach theanchaca with no luck. We have the kitchen in the back of the truck, and all the tents are up. A couple filled with water from the rain, but other than that a perfect permanent camp.

We prepped animals in the evening. Scott spent several hours trying to radio someone/anyone in the States, with no luck. Continuing rain, mist, and cold.

12 July

I woke up this morning late (8:00) with the vague sensation that the sun was shining, but looked out the window to see only thick fog/mist and light rain. Syd said the fog ~~was~~ <sup>had</sup> lifted earlier and he could see the hills all around us, but now they are hidden.

I checked my traps and found only 1 Akodon fairly near the road. Total animals this morning:

MLC	Akodon	1	SRO/ANQ	(1) escapee
JSB/EP	Thylamys 1	} 9	ALS/SGH	1 Akodon
	Akodon 2		ELP/LASB	2 oligoryzomys
	Oligoryzomys 6			
SLG	Oligoryzomys	1		

(18) + 1 escapee  
112

12 July

Marcel L. Campbell

Bolivia  
1991

Tapesna

Journal

14

~~18~~ animals of the following number of traps:

MLC 50

11-12 July

JSB/EP 80

ELP/LASB 76

SRO/ANQ ~~86~~ 60

SGH/ALS 56

SLG 40

14 animals & 356 Shermans ~4%

Scott managed to call Roxanne of Emi Cruz in Santa Cruz on the radio this morning. No message. If anyone wanted to contact us from the States they could reach us through Roxanne by FAX. She is the ~~the~~ secretary to Mike Bennett, geologist / friend of Scott & Terry's. We did get the frequency verified <sup>for</sup> ~~from~~ Huanchaca <sup>her</sup>.

Jorge tried to reach Huanchaca  
Frequency again & almost gave up when we heard 8450 USB a faint response. Incredibly, we managed (also get some sort of Morse code beacon on that channel) to get through. Frasty & Jon are OK; also Fabiana & Roman, the Bolivian students. They have caught 200 animals and many neat species. They will leave tomorrow ~~morning~~ for Santa Cruz & will meet us in Tarija on the 16<sup>th</sup> of July.

In the afternoon we set out all the remaining traps. Terry, Scott & Santiago, Lila & Emma went up the

12 July

Mariel L. Campbell

Bolivia

Tapicua

Journal

1991

hill behind camp to set carnivore traps + Tomahawks. They set a total of:

5 Tomahawks (large)

5 ~~Conibears~~ Conibears ~~5~~

5 Tomahawks (small)

2 steel traps

Scott found Ctenomys mounds up the slope + returned to set traps (Conibears). He set 9 traps.

Everyone rechecked + reset their trap lines. Angela + Sandra pulled their line from along the cow trail + reset it further into the woods. Jorge + Eduardo added 16 traps to their line. cl added 29 traps to my line, continuing down into the ravine and up the other side. While checking my line of 50 from last night at ~ 4:30 pm, cl found one of the traps closed with a very small Monodelphis inside. It may be a baby, but it may be Monodelphis kussi. We'll see.

It was in ~~some~~ a few rocks + shrubs ~ 10' above the rock-filled ravine. cl didn't replace the trap.

Total Shermans out 12-13 July:

MLC	78	}	+ 6 Tomahawks on their line
JSB/EP	96		
LASB/ELP	74		
ANQ/SRO	60		
ALS/SGH	54		
SLG	40		
			= <span style="border: 1px solid black; padding: 2px;">402</span> Shermans

Marcel L. Campbell

Bolivia  
1991

12 July - 13 July

Tapecua

Journal

Jorge + Amparo also set bat net<sup>a</sup>. ~~There were~~  
~~one ~~costly~~ ~~net~~~~ <sup>nets</sup> along the south + west  
sides of the cattle pond nearby.

The weather cleared up a bit during  
the day, with the clouds lifting above  
the hills. We prepped mice all evening.  
At ~11:00 Scott, Jorge + I went to check  
the tuco traps and brought back a  
darkish-brown-colored Ctenomys. No one  
is quite sure which species. It is  
small to medium in size, definitely not  
conversi.

In the bat net at ~8:00 pm Amparo  
collected a Desmodus rotundus with blood  
on its lips. At ~10:00 pm a large Artibeus  
was in the net.

I stayed up late prepping the  
Mosdelphis, which does appear to be kunsi.  
It measured only 115 mm total length, and  
has a white patch/strip down the venter.  
The dorsal coloration is dark brown. It  
looks very much like the marsupial version of  
a shrew.

When we went to bed at ~2:00 am  
the mist + fog had returned, soaking  
everything once again. Cold + wet night.

13 July

Still cold + wet this morning, with the  
camp + surrounding hills ~~so~~ surrounded

13 July

Marcel L. Campbell

Bolivia

Tapicua

Journal

1991

in mist. A light rain was falling as I went to check my traps ~ 8:30. I caught 3 Akodon on my line; 2 at the base of fallen, moss covered logs & one next to the base of a tree.

Total captures 13 July:

MLC	3	<u>Akodon</u>
SRO/ANQ	1	<u>Oxymycterus</u>
	1	<u>Akodon</u>
	1	<u>Oryzomys</u>
JSB/EP	5	<u>Oligoryzomys</u>
	1	<u>Rhipidomys?</u>
	1	<u>Akodon</u>
ELP/LASB	3	<u>Oligoryzomys</u>
	1	<u>Thylamys elegans</u>
SRO/ANQ	1	<u>Oryzomys nitidus</u>
	1	<u>Oxymycterus</u>
	1	<u>Akodon</u>
SGH/ALS	1	<u>Akodon</u>
	1	<u>Gracomya domorum</u>
	22	animals of 402 traps
		= ~ 5%

We have at least two different species of Oligoryzomys, possibly chacoensis & longicaudatus. We also may have 2 forms of Akodon.

Terry also caught a Didelphis albiventris in his traps (Tomahawk) on ~~same~~ mackerel (jamel) bait (in oil. Another trap had been knocked about by a jaguarundi-sized cat. No more traps.

13 July

Maricl L. Campbell

Bolivia  
1991

Tapacua Journal

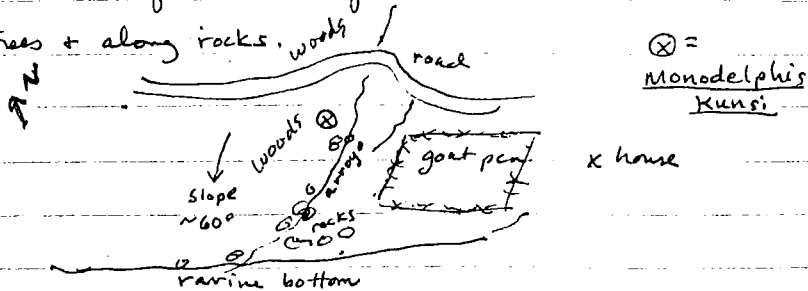
We did a run of 8 animals in the morning. In the afternoon the weather cleared a little again, with the clouds lifting somewhat. Continuing cold, however.

At ~ 4:00 I went with Santiago to set more traps in the area where I caught the Monodelphis yesterday. A couple of my traps were closed but empty. I set an additional 25 traps in the immediate vicinity of the capture site from yesterday. I ~~also~~

caught the Monodelphis in a relatively flat, (N30°) <sup>(at ground level, good canopy cover)</sup> open area ~ 10' from the base of the ravine/arroyo,

and only ~ 50' below the road cut. Today I realized that the thorn fence marking the end of the goat pen of the adjacent property is only ~ 750 feet (less actually) ~~to~~ away through a few shrubs + trees to the east. This is definitely not pristine, undisturbed habitat.

I set traps both in open <sup>flat</sup> areas + next to trees + along rocks. <sup>woods</sup>



Santiago + I also set 6 pitfall traps in the area. We set 2 in the arroyo, 1 in adjacent arroyo, and 3 up on the slope between arroyo + goat pen. All were set along logs or rocks; the last one

13 July  
Tapacua

Marisol L. Campbell

Bolivia  
1991

Journal

was set along the border of the thorn fence  
for the goat pen next to a rock.

cl rebaited with banana/oatmeal/vanilla  
mix. Yesterday my bait was the above mixed in  
with ~~2~~ sardines in tomato sauce/oatmeal/vanilla.

cl found 2 birds in 2 of my Shermans; they  
looked like odd sparrows, with black + white markings  
on the head. cl released them.

We prepped all evening. Still overcast,  
cold, + misty.

Total traps out 13-14 July:

MLC	100	
JSB/EP	<del>26</del> <sup>91</sup>	(12 traps moved)
SRO/ANQ	57	
SGH/ <del>A</del> ALS	33	
	40	
SLG	<del>33</del>	
ELP/LASB	73	
	<u>394</u>	traps

We saw a toucan fly over camp in the afternoon.

Saw 2 condors fly by camp towards east,  
+ some vultures; something dead nearby.



Maricl Lee Campbell

Bolivia  
1991

Tapecua Journal

14 July

Still overcast, but drier this morning.  
The clouds have lifted somewhat.  
I caught 5 animals / 5 genera in my traps, but no marsupials, unfortunately.  
Two of the animals were caught exactly where animals were caught yesterday, along the base of 2 separate rotten logs.

Trap results 14 July:

MLC	5	{ <u>Graomys</u> <u>Oryzomys</u>	{ <u>Oligoryzomys</u> <u>Akodon</u> <u>Rhipidomys</u>
JSB/EP	4	<u>Oligoryzomys</u>	
	2	<u>Akodon</u>	
	1	<u>Oryzomys nitidus</u>	
SLG	0		
SRO/ANQ	1	<u>Oligoryzomys</u>	
	1	<u>Rhipidomys</u>	
ELP/LASB	1	<u>Oligoryzomys</u>	
	1	<u>Akodon</u>	
SBH	2	<u>Akodon</u>	

18 animals of 394 traps  
~ 4.5%

Terry also caught another:

Didelphis albiventris

and Conopatus rex

in his Tomalauk traps.

Nothing in my traps in the afternoon, I went to look at Scott's two traps in the evening; the burrows are up the sides of incredibly steep slopes interspersed in rock (metamorphosed limestone) outcrops.

M. L. Campbell

Bolivia  
1991

*Tayassu*

Captures 15 July

Trap F-1 Rhipidomys

on ~50° slope in fobs, dead leaves

Total <sup>shuman</sup> traps out 14-15 July

MLC	96
SLG	20
ANQ/SRO	57
EP/JSB	51
"	40
ELP	32
LA-SB	39
SGH	31
	<b>366</b> traps (shuman)

+ Tomahawks

+ trico nets

(  
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Marcel L. Campbell

Bolivia  
1991

Tarija Journal

18 July

We've been staying in the Hotel Prefectural the last couple of days, sending Sandra, Angela + Amparo back to La Paz and Terry Yates, Scott Gardner, + Jorge Salazar back, eventually, to the States.

On Friday, 3 more students arrive from Santa Cruz. In the meantime, our current group consists of:

Marcel Campbell

Sydney Anderson

Eduardo Palma

Lila Alejandra Sainz

Emma Luna Pizarro

Otto Carlos Jordan of the Santa Cruz Zoo

Forrest<sup>W.</sup> Davis } recently-rejoining  
Jon<sup>L.</sup> Durnum } us from Huanchaca

Santiago Garcia Herbas

We left ~~town~~ at ~10:30 a.m., drove for ~15 min, and were pulled over by a traffic cop because people were hanging their feet over the bed of the truck. Otto Carlos, our designated driver, interpreted this harassment to mean the cops needed to fill the gas tank on his motorcycle. 15 minutes and 21.3 worth of gasoline later, we were back on the road. This was our second encounter with Tarija traffic cops. The first was 15 min. after we arrived in town, when

Bolivia  
1991

Marisel L. Campbell

Tarija

Journal

Scott got pulled over for making a U-turn in front of the hotel. In general, our impression of Tarija has been that it is a beautiful city, but beware of corrupt traffic cops and don't try to get anything done between the hours of 11 a.m. and 3 p.m., as everything, even the restaurants, shuts down.

Erguis  
2100m

We have decided to go just north of town to the Valley of Erguis for our first campsite. Tomorrow we have to return to town to pick up 3 more students and therefore couldn't go far.

The Valle de Erguis turned out to be a heavily populated, agricultural area dependent on irrigation. We were initially searching for the house of a man Syd knew of indirectly, but when it turned out he had been living in Santa Cruz for two years now, we found our own campsite. We are camping in a small, newly built house on the property of Valentina next to their fruit orchard. A small, overgrown irrigation ditch runs by camp (Syd), and there are several stock ponds in the vicinity. This valley is full of introduced eucalyptus, pine, & juniper, as well as an ornamental Santiago knows as "moye" and which I believe is called "pimenton" in Argentina.



Marcel L. Campbell

Bolivia

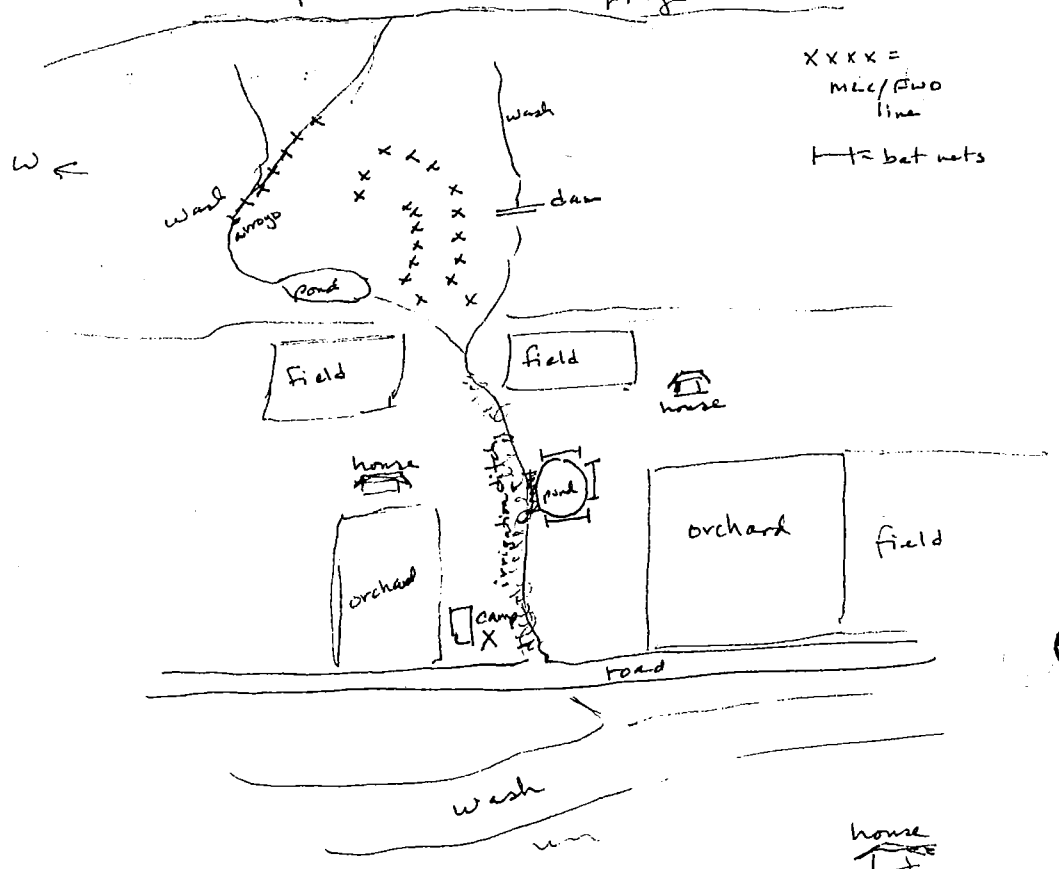
1991

Erquis

Journal

Behind us is the house of the property owners, and then the south facing rim of the valley. These slopes are fairly barren, with scattered shrubs (Senecio + ?) and occasional Acacia trees/shrubs (white thorns). On the scattered rock faces there are clumps of Stipa grass, otherwise the slopes are heavily overgrazed.

We set up camp leisurely, & then went off to set traps. Frosty and I went up <sup>into</sup> along the hills with 160 traps. The others set traps down in the valley along fields + rock levels. Jon set 40 traps along the irrigation ditch by camp. He also set 3 bat nets over the park-ridge



Bolivia  
1991

Maribel L. Campbell

Erquis Journal

Total traps out 18-19 July

MLC/FWD 155

JLD 40

OCS/ELP/LASB 156

EP/SGH 120

471

Shermans

+ 3 bat nets

Clear, cold in evening, with bright moon  
at  $\frac{1}{2}$  waxing up by sunset, setting  
pre-dawn.

19 July

Frost this morning. Clear.

Frosty had 16 of his traps missing this  
morning. We believe it must have been  
children who saw us putting out traps  
yesterday evening, as the missing traps are  
near the house. We've spoken to the parents.

No bats last night.

Total captures 19 July:

JLD 2 Rattus

2 Grammys

2 Akodon

EP/SGH 2 Akodon

OCS/ELP/LASB 3 Akodon

2 Calomys

1 Mus

14 animals of 471 Shermans  
(actually 455 traps)

No animals in  
line of 160 in  
hills

Marie L. Campbell

Bolivia

1991

Journal

Erguis

We prepped morning → mid-afternoon. The Akodon here are pale colored, at least 2 spp., one with orange rings around the eyes. Syd thinks they may be in the puer or caenosus group. The Cebonyx may be musculinus. The Gracops are small, more Phyllotis sized, with white bellies / grey basal hair. Possibly domorum.

At 2:30 Otto, Frosty, Santiago, Emma + Alexandre went into town to shop + pick up the students from Santa Cruz.

Jon, Eduardo + I set traps in the evening. I've been down with a cold, so I only set 40 traps along the edge of a rock wall + harvested corn field in shrubs, grass, fobs + Acacia. Jon set his traps up the same way as last night, setting 80 traps this time, plus an additional 20 traps behind the house next to camp.

Eduardo set 120 traps also. Tomhawk traps also out - FWD JLD.

Total traps out 19-20 July

MCC	40
JLD	100
EP	120
	<hr/>
	[260] Shermans

Clear, much warmer than last night, almost balmy. Moon at ~ 3/4 full. All three bat nets up.



Bolivia  
1991

Marisel L. Campbell

Erquis

Journal

20 July

Clear this morning, warm (relatively).  
I caught 8 animals of 40 traps this  
morning, a big improvement over last night. One miss.  
trap.

Total trap results 20 July

MLC 4 AKodon

1 Graomys

2 Rattus

1 Cavia Galea

JLD 4 AKodon

1 Rattus

EP 9 AKodon

1 Galea

1 Mus

4 AKodon

3 Calomys?

31 animals of 260 shermans = ~12%

The others arrived past dark last, bringing  
food & more students. This additions to our  
crew are Maria Dolores Carrero and  
Christina

We spent the day prepping. There are enough  
people here now that we can work fairly quickly  
& efficiently at prepping & cooking simultaneously.  
We had some trouble with the generator,  
which refused to start until it was taken apart,  
cleaned, & put back together. Eduardo had to  
fix his cell suspensions in methanol for at least an hr.

20 July  
Erquis

Mariel L. Campbell

Bolivia  
1991

Journal

Jorge has the hand centrifuge in La Paz, so we have no alternative if the generator is down.

In late afternoon Otto, Christina & Emma went back into town. Christina tried to call Jose Luis, another student, in Santa Cruz, to tell him not to arrive next Friday. All the students were scheduled to have arrived in Tarija on the 16<sup>th</sup>, but for various reasons they've all changed arrival & departure dates ~~on~~ on their own. It makes it a little difficult to schedule time in the field when we have to keep coming into Tarija. ~~She~~ <sup>Chris</sup> couldn't get through. However, Emma had to leave to go back to Santa Cruz because the other students say her leave of absence request may have been denied. She will try to return by the 31<sup>st</sup> of July.

In the evening everyone but Syd & I set out traps. We need 280 to reach 1000 trap nights for this locality. I worked on parasites.

Total traps out 20-21 July

FWD	80	79	+ 7 Caribears (up canyon in hills behind camp)
SGH/MOC	80		around field
EP/LASB	80		
"	40		
JLD	40		+ 6 Tomahawks

319 Shermans

6 Tomahawks,  
7 Caribears

Mariel L. Campbell

Bolivia  
1991

Erguís Journal

21 July

Woke this morning to the sound of flutes + drums as a procession of local people passed by carrying their patron saint on a platform. There is a road race today from Tarija to ~~para~~ Potosi on the highway we will be travelling, but all the festivities (and road closures) should be over by noon.

We picked up all the traps. Eduardo lost 3 more Shermans off his line. This is a productive locality but costly in terms of traps stolen. We had 15 of our original 16 returned by 2 boys at the obvious insistence of their parents, but were lost 9 total of 5 in 3 nights trapping. We gave 10 B to the parents in gratitude.

Total animals 21 July

FWD 2 Akodon

1 Phyllotis } new, this locality

1 Thylomys }

SGH/MDC 9 Akodon

1 Graomys

1 Mus musculus

1 Galea

EP/LASB 8 Akodon

1 Calomys

1 Mus

JLD

1 Graomys

8 Akodon } ↓

35 animals

+ 1 Galea in Tomahawk

24 July

Marisel L. Campbell

Bolivia  
1991

→

Serrania Sama

Journal

We packed up camp and were on the road by 11:00 a.m. We drove north, then west on the highway to Escayachi, climbing into the hills above the Valle de Enquis where we were camped. These hills are fairly barren, rocky, and beautiful. On the narrow gravel highway we had to stop and wait at one point to let a herd of ~100+ llamas pass by. They all had colorful ribbons tied on ears & in fur, and were being used to carry blocks of salt into Tarija. Santiago says 2 blocks of salt is the maximum load for a llama, and on long journeys such as this one they must have twice as many llamas as loads, ~~as they~~ since each llama must trade off with another, rested llama every so often.

Approximately 7 km as the crow flies (according to Syd) from our last camp, we stopped on a ridge to let the truck cool, and then decided to make camp. A small, barely discernible road travels up from the highway onto a flat area along the ridge, & we drove the truck up & unloaded.

Our new locality is Serrania Sama, 3200m  
21° 27' S, 64° 52' W. We had camp set up not long after noon.

Everyone set traps after camp was established. I set a line of 79 up a grassy filled draw along the ridge

21 July

Marisel L. Campbell

Bolivia

1971

Sama

Journal

above camp. In this little depression the grass (*Stipa* or *Festuca*) grows much thicker & higher (~30cm) in and among the numerous rocks & rock ledges. My line travels up to the top of the ridge along one side of the draw, then back down the other side of the draw back again towards camp. The other side of the ridge appeared much too barren & exposed for good mouse habitat. While setting traps I saw one small Akodon type mouse run into a clump of rocks & grass. Other vegetation here includes lichens, occasional small shrubs, & ferns (tiny) and little cacti tucked down in between rocks.

Total traps out 21-22 July

MLC	79
JLD	86
FWD	70
SEH/LASB	<del>28</del> 34
EP	80
OCJ/MDC	80
	<u>429</u> Shermans

By 8:30 pm the temperature was 0°C. We prepped animals till very late. A heavy fog closed in on camp, and by post-midnight it had begun to freeze & fall as snow/sleet. Moon ~ 3/4 full, but barely visible in the fog.

Marcell L. Campbell

Bolivia  
1971

Sama

Journal

22 July

Woke this morning to white outside:  
The ground was covered with snow-like hoar  
frost. Temperature at 8:00 a.m. =  $-12^{\circ}\text{C}$ .  
The camp was still enshrouded in mist,  
but the sun quickly began to burn it all  
away.

Trap results 22 July

MCC	1	<u>Phyllotis</u>
	1	<u>Akodon</u>
	1	<u>Thylamys</u>
JLD	1	<u>AKodon</u>
FWD	2	<u>Phyllotis</u>
LASB-SGH	2	<u>Phyllotis</u>
EP	2	<u>Phyllotis</u>
	1	<u>Bolomys amoenus</u>

OCT/MDC 0

11 animals of 429 traps

(I'm writing Bolomys

after the fact - at first we  
thought it was an orange  
Akodon with white belly)

We prepped all day. There are  
at least 2 species of Akodon here. The  
Thylamys died in the trap, but was in torpor  
when I first picked it up.

In the afternoon we ran trap lines again,  
I caught a large Akodon-like mouse which  
may be Bolomys lactans. It has an

Marie L. Campbell

Bolivia  
1991

Sama

Journal

ochraceous belly and a white patch under the chin. Tom also caught an Akodon and another Bolomys amoenus during the day on his line. If these are indeed Bolomys amoenus, this is a 500+ km range extension for the species. If the other species is truly Bolomys lactans, we have the two species in sympatry here. They both have Bolomys-like white, buck-toothed incisors. B. amoenus also has pale yellowish feet (dorsal) and a semi bicolored tail with dark dorsal band & orangish sides. It has a shorter tail relative to B. lactans. Two of the three specimens we have were caught in the daytime.

There also may be two species of Phyllotis in sympatry here. The one I brought in from my line this a.m. was small & grayish, vs. the more orangish brown <sup>larger</sup> specimens from other lines. It may be Phyllotis xanthopygus, and the others Phyllotis caprinus.

The Thylamys also appears different from the Thylamys we trapped 7 km below in Erguis. The specimen here is more grayish, whereas the Erguis specimen is more brown dorsally with a more distinct lateral division between dorsal & ventral coloration.

22 July - 23

Maridel L. Campbell

Bolivia

1991

Sama

Journal

There is also a notable difference in the length of the caecum. The grey form may be T. pallidior or T. pusilla; the brown species T. elegans.

To bed early. Have been down with a cold, yet again. 3/4 moon, clear, cold. (8:30 pm. 0°C)

23 July

Nothing in my traps this morning. Fewer animals were caught in general; Possibly because of the moon + clear sky?

Total captures 23 July:

LASB-SGH 1 Phyllotis

OCT/MDC 2

FWD 2 Phyllotis

LASB/SGH 1 Phyllotis

~~40~~ 6 of 463 traps

Total  
Traps out last night  
22-23 July

~ 1%

MCC 74

EP 80

JLD 85

LASB/SGH 40

34

OCT/MDC 80

FWD 70

463



Marcel L. Campbell

Bolivia  
1991

Sama Journal

We finished prepping by early afternoon. Several people changed traps around. I left my line, replacing traps in the afternoon ~ 4:30. I found another Bolomys lactans on my line, dead from heat stress in the trap. It was caught 1 trap station, ~ 15', from the one I caught yesterday. Both are males. Alejandra also caught 3 mice on her line during the day.

Total captures 23 July (diurnal): <sup>pm check</sup>

M.L.C.	<u>Bolomys lactans</u>	1
L.A.S.B./S.G.H.		<u>3</u>
		4

In the afternoon ~~then~~ we saw the llamas again. This time they are returning from Santa Cruz, it appears. Eduardo talked with the herders. Apparently they left Potosi with their load of salt on July 3. They will exchange their salt for corn in Tarija, after a months journey, almost.

Total traps out 23-24 July:

M.L.C.	76
L.A.S.B./S.G.H.	74
ED	50
FUD	46
JLD	28
O.C.S./M.D.C.	85
	80
	1,000 AT Chemers

Maricl L. Campbell

Bolivia  
1991

Sama → Iscayachi Journal

24 July

Clear & cold last night, with strong winds which died down by sunrise. Still, it was much warmer at dawn than the previous 2 ~~day~~ days. We pack up camp today & go over the pass to Iscayachi, a Ctenomys lewisi locality which, despite being in a valley, is still higher in altitude than our current camp.

I caught 3 Phyllotis on my line this morning 2 of which were P. xanthopygus. Several more Bolomys anoenus were also brought in off various lines.

Total animals 24 July (Sama)

MLC	2	<u>Phyllotis xanthopygus</u>
	1	<u>P. caprinus</u>
FWD	{	<u>Phyllotis caprinus</u> <u>Bolomys anoenus</u>
OCT/MDC	1	<u>Bolomys anoenus</u>
	1	<u>Phyllotis</u>
LASB/SGH	2	
EP	1	<u>Phyllotis caprinus</u>

10 animals of 469 traps  
~2%

We packed up camp & were on the road by 11:15 a.m. As we drove up we immediately started seeing a greater abundance of clumped, yucca-like plants. Jon said he saw a few on his line of the last few nights. They seemed especially common in burned areas.

Marisel L. Campbell

Bolivia  
1991

24 July

Same → Iscayachi Journal

We crossed the pass at 3750+ meters, and looked down into the valley of Iscayachi. We left the rocky, barren hills ~~back~~ and descended into a grassy, rocky river valley heavily cultivated for potatoes, beans, garlic etc. The houses here are all constructed of rocks + adobe, with sod roofs. Numerous walls enclosing pasture and cultivated fields have also been laboriously put together out of rocks. The town of Iscayachi, itself is actually surprisingly large (a relative concept), with several

small hotels and a municipal well (faucet = water from 10 km away). We stopped along the bridge over the river (at the moment very shallow + rocky, much of it diverted into canals for agriculture), and immediately found *Ctenomys* mounds.

Eduardo, Otto + I spoke with some nearby people sowing garlic, and they said there should be no problem with our staying nearby, but we should talk to the "consejidor" of Iscayachi anyway.

As he was not in town at the moment, we filled our water jugs + then returned to the bridge, setting up camp in a flat grassy area at the edge of the river drainage.

Frosty + Jon set juco traps immediately. By the time we had camp

24 July  
Iscajachi

Marcel L. Campbell  
Journal

Bolivia  
1991

set up they returned with 2 juvs.  
They lost several more in the newer  
macabees, which Frosty detests for that  
reason. While they were setting traps  
small, dark Akodon like mice ~~are~~ were  
running around in the grass. Syd says ~~there~~  
Akodon boliviensis were collected in large  
numbers here previously. There is also a  
record of Marmosa pallidior from ~~the~~ 1 km  
this E Iscajachi. ~~there~~

In the evening Eduardo set out  
40 Shermans along the river. We didn't  
set more for fear of their being stolen.

Total trap count as of 11:00 pm:

6 Ctenomys lewisi

We propped animals, played cards etc till late.  
Cold & clear; 0°C at 9:30 pm. Moon nearly  
full.

25 July

Ice on the river this morning. There  
is a crust of ~ 1 cm thick, below which  
~~are~~ hundred of small black tadpoles are  
still moving around in the ~ 1-2 inches of  
unfrozen water. (possibly Telmatobius simonsis)

Eduardo caught 1 Akodon boliviensis  
in his traps.

Frosty caught 3 more Ctenomys lewisi,  
with several more escapees. One of the

Marisel L. Campbell

Bolivia  
1991

25 July

Iscayadi

Journal

Captures was a ~~re~~ recapture in the same burrow, indicating possible sociability in this species.

There are many small children who follow us continuously. It will be hard to avoid ~~losing~~ losing traps.

The red flags marking holes are possibly an even bigger temptation.

Frosty saw a large rodent run into a burrow, and thinking it was a *tico-tico*, ("tojo" here), ran after it + stuck a maccabee into the hole. He caught a *Galea musteloides* by the hind leg.

It turned out that there were 2 more in the hole, a blind ended tunnel. We caught the other 2 by hand. The children say they are very tame, and don't bite. They call them "conejos". One of their dogs also caught an *Akodon*, possibly *puer*, which we brought back to camp.

We started prepping after lunch.

Strong winds picked up in late morning and continued through most of the day. Out of the wind it was warm.

We had quite a swarm of people in camp throughout the day, ranging from children + curious adults to military officers + the mayor. Some just set down at a distance and watched. Others,

25 July  
Iscayacachi

Marivel Campbell

Bolivia  
1991

Journal

particularly swarms of boys of various ages, crowded around the prep tent & ran about among the tents, making all of us a bit nervous for any loose item unattended.

We told them we'd pay 20 centavos for rodents & urine (Galea), and we had 1 additional Galea by the afternoon. One young enterprising capitalist brought another, but wanted 1.5 Bolivianos for it, and wouldn't sell it when we wouldn't pay that much.

The military officer reminded us just how important it is to make contact with all appropriate agencies & to have proper documentation. He stormed into camp on a motorcycle, demanded to know who we were, what we were doing here, where we'd come from, and then refused to listen to answers provided by Otto; he came into the prep tent where Jon & I were working and asked us the same questions. I told him we were ~~working~~ working on a ~~survey~~ survey of mammals & diseases etc, showed him mice which seemed to pacify him a little. However, he wasn't satisfied until we showed him our authorization ~~from~~ from the authorities, which he demanded. Fortunately we have

25 July

Marisel L. Campbell

Bolivia  
1991

Iscajachi

Journal

Letters from numerous government agencies, military command, and especially, from the Bolivian consulate authorizing the American members of the crew to work here. He asked Jon + I if we had our passports, but didn't ask to see them.

Our visibility here has its drawbacks; we can't set many Shermans, and Frosty had several <sup>(3)</sup> traps stolen by the end of the day. The kits picked up a flag + a trap in a trap + moved it, but he caught it in time.

2 more Ctenomys lewisi by nightfall. Full moon, clear + cold. Frosty also brought in another Akodon boliviensis caught out by the trap traps. Eduardo set another line of 40 Shermans along the river. We prepped all but 2 of animals (the Galera). Up late playing cards, or (in my case) doing parasites.

26 July

Slept in late this morning, all of us. I woke up at 8:00 but went back to bed after being out in the cold wind a matter of minutes. Several others are starting to get nasty colds; most of the Santa Cruz students don't even have jackets.

Marisel L. Campbell

Bolivia  
1991

Iscayachi Journal

Around noon everyone but Jon, Frosty, Eduardo, Christina, Syd + I went into town for water + groceries. Christina brought in a couple of small frogs she found by the river, including a tiny black one I believe to be the adult of the black tadpoles I found earlier. Another has eyespots on its abdomen, ~~and~~ <sup>above</sup> its hind leg, and has a face that looks similar to a Ceratophrys. Jon + I went out in the afternoon and collected more frogs + tadpoles, as well as some little catfish, snails, amphipods, small (tiny) clams, and caddisfly larvae. In this river bed are distinct microhabitats occupied by different species. There is an <sup>isolated</sup> deep pool with very large (2-3 in long) tadpoles, and 20' feet away in very shallow <sup>running</sup> water the small black tadpoles are the only visible inhabitants. I wonder if they have some defense against being eaten, as they are easy prey. Apparently they <sup>(underlife!)</sup> overwinter as tadpoles as well as adults as we've found both, including intermediate stages. The local people say the frogs breed (& call) in October. Another microhabitat, a fast flowing, shallow, rocky rivulet, contains the small catfish, which we couldn't find nearby in a eutrophic, slow moving channel full of algae, amphipods + long brown tadpoles. We found the claw of a fresh water crab, but no luck finding live ones.



26 July  
Iscajachi

Marcel L. Campbell

Bolivia  
1991

Journal

This morning Eduardo caught 4 Akodon on his line of 40 from last night. Frosty also caught an Akodon and 2 Galea by hand, as well as 2 Ctenomys lewisi in his traps. Several of the Ctenomys have been infected with intermediate (larval) stage cestodes (one severely, with entire body cavity filled), indicating perhaps they are being eaten by some other, final host (a bird?, dog?). The local people say there used to be foxes + cats here, but now they are only up in the hills. Possibly the tucos are paratenic hosts.

We've decided to stay here another night but trap in the hills to the east near our previous camp. Everyone but Frosty + I went off to set traps in the evening. Apparently one of the mice we caught the last night at Ferrania Sama was an Andinomys. It would be good to have a bigger sample of that species. Budin's collections from Sama in the 1920's indicate that Andinomys, Akodon albiventer, Abrocoma cinerea, + Thylamys pallidior were all here. The wind died down by evening. Still clear, cold, full moon.

Maribel L. Campbell

Bolivia  
1991

Iscayachi

Journal

27 July 1991

Clear and cold in a.m. The Sherman-trappers returned with 18 animals, plus more in afternoon.

Total animals 27 July 4.5 km E Iscayachi

EP	2	<u>Phyllotis</u>	
JLD	4	<u>Phyllotis</u>	
LASB/SGH	3	<u>Phyllotis</u>	
	8	<u>Akodon</u>	
	1	<u>Oxymycterus</u>	
	2		
MDC/MCT	2	<u>Akodon</u>	} afternoon check
	1	<u>Phyllotis</u>	
LASB/SGH	4	<u>Akodon</u>	} afternoon
JLD	4	<u>Akodon</u>	

(29) somehow this totals to 29

Total traps out last night 26-27 July

EP	40
	40
JLD	80
LASB/SGH	118
MDC/MCT	105

Oct 80  
463

~ 7%

I bought the skin of a Felis <sup>waidii</sup> ~~geoffroyi~~ <sup>#10</sup> ? in (Iscayachi) town from a store owner. He says he hunts animals for skins to sell to tourists passing from La Paz + Tarija. He also had a mounted skunk on the wall. I asked for locality data on the cat; he had to think a while, but gave me a locality which is fairly accurate, I believe. He was impressed when I told him the skin would go to a museum.

27-28 July

Marcel L. Campbell

Bolivia  
1991

Iscayachi

Journal

Total traps out tonight <sup>27-</sup> 28-July

JLD 72

EP 79

MDC/MCT 105

OCT 78

LASH/SCH 106

~~440~~

440

shermans

Frosty has had a number (10) of macabee gopher traps stolen. People are constantly swarming about, and it is impossible to set traps without being observed. For that reason Frosty pulled all the gopher/tico traps. We've also got a sample of ticos with parasites by now.

I've been too sick to go out & set traps, and my notes are therefore not the greatest. Still cold, and we wake up to ice on the washpan in the morning.

28 July

We picked up camp this morning & headed out towards Tarija once again. We didn't get on the road till 11:00, and we stopped on the way to pick up traps at 4.5 km E. Iscayachi. We caught a total of 24 animals, but Eduardo had 16 of his traps

27-

Marcel L. Campbell

Bolivia

28 July

1991

Iscajachi →

Journal

stolen. His entire line had been picked up + piled together (unfolded), with 16 traps missing. This has been an expensive locality as far as traps stolen. We drove back down to the valley + interrogated various people, with no luck. Eduardo offered a reward for the traps, up to 100 Bolivianos if all returned. The fellow he talked to said if he got a hold of them he would bring them to our hotel in Tarija.

Total animals 28 July

LA5B/SGH	9	<u>AKodon</u>
	1	<u>Phyllotis</u>
	1	<u>Andinomys</u>
	1	<u>Oligoryzomys</u>
MOC/MOT <del>FLWA</del>	2	<u>Phyllotis</u>
	1	<u>Calomys</u>
OCT	2	<u>AKodon</u>
EP	1	<u>Calomys</u>
	2	<u>AKodon</u>
JLD	3	<u>Phyllotis</u>
	1	<u>Oligoryzomys</u>
	(24)	of 7440 traps
		<u>1.5%</u>

Marcel L. Campbell

Bolivia  
1991

→ Tucumilla Journal

We finally got on the road again after 2 pm & travelled up over the Cuesta de Sama & down again, passing our previous campsite & continuing down to 2500 m elevation. We passed the little town of Tucumilla, & made camp along the side of the road at 1 km E Tucumilla, 2500 m.

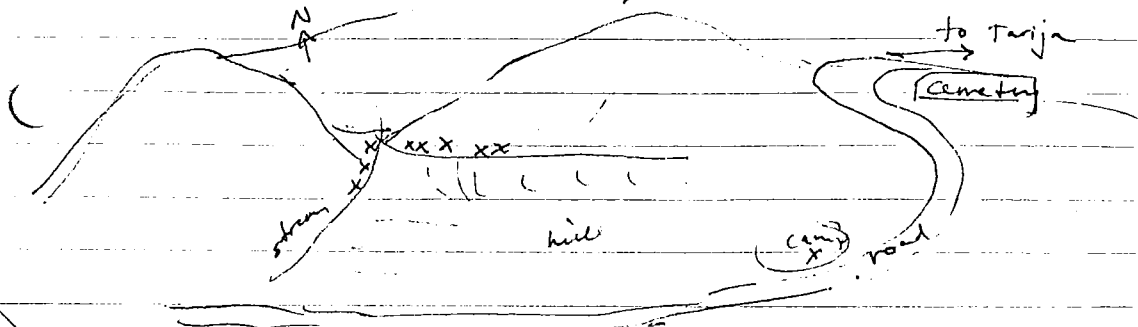
These hills are still rocky & grass covered, but with a few more shrubs & small trees than higher up.

It is much warmer here, and we all felt the difference in elevation.

I set a line of 40 traps down the hill in a narrow stream bed with occasional pools of standing water. Grassy hills rise steeply to either side.

Along the stream bed are many rocks, some shrubs & clumps of thick grass, & occasional

Acacia cf. aroma trees. I followed the stream to its confluence with another drainage, then up along the other drainage a ways. Bait with oatmeal, fish, vanilla.



28 July  
Tucumilla

Marisel L. Campbell  
Journal

Bolivia  
1991

Total traps out 28-29 July

FWD	36
MLC	38
EP	40
OCT	40
LASB	40
MCT/MDC	80
JLD	70
SGH	40
	<u>384</u> shermans

We prepped animals till late.  
Moon waning from full, rising ~ 8:00pm  
on eastern horizon.

(22 July) (Jon caught some neat Hyld  
frogs in the stream ~~where~~ where he  
set his traps at 4.5 km E. Iscayachi.)  
He collected several. Some are bronze/gold,  
others bright green, with variable  
markings. Most have vertical ~~stripes~~  
stripes on the inner thigh.)  
They were sunning on rocks. Christina  
also caught a couple of similar  
frogs in the Rio Tomayapo by  
camp.

Mariel L. Campbell

Bolivia  
1991

Journal

29 July 1991

Many animals this morning. <sup>in my line</sup>  
I caught 2 Oligoryzomys, <sup>Calomys</sup> ~~Phyllotis~~ and  
and 2 Akodon along the stream.

Total trap results 29 July

MCC	5	
FWD	1	<u>Thylamys</u>
	2	<u>Phyllotis</u>
	1	<u>Bolomys</u>
OCT	2	<u>Calomys venustus</u>
JCD	1	<u>Thylamys</u>
	1	<u>Oligoryzomys</u>
	2	<u>Phyllotis</u>
	3	<u>Akodon</u>
EP	2	<u>Calomys</u> <sup>venustus</sup>
	1	<u>Akodon</u> c.f. <u>pus</u>
MDC/ET	1	<u>Thylamys</u>
LASB	1	<u>Phyllotis</u>
	1	<u>Andinomys</u>
	1	<u>Akodon</u>
SGH	2	<u>Akodon</u>
	(27)	animals of (384) traps
		(~7%)

Last night was calm & warm, with full moon  
just beginning to wane, (rising ~ 8:00 p.m.) by  
morning strong winds had picked up from the  
NW, with scattered high clouds.

Marcel L. Campbell

Bolivia  
1991

Tucumilla Journal

We prepped ~~all~~ day. In the afternoon trap check Maria Dolores brought in an Akodon and a Bolomys cf. lactans off their line. Windy all day, with some very strong gusts from the NW.

Moon rising after dark, waxing from full. Clear + balmy. Stayed up late prepping my 500<sup>th</sup> specimen in Bolivia + playing "Carioca." Santiago won this time, not Jon.

Total traps out 29-30 July

MLC	44*
SGH	38
DWD	{ 12 32
OCT	40
EP	40
CASB	35
MDC/MCT	77
JLD	80
	<hr/>
	<del>386</del> traps
	<span style="border: 1px solid black; padding: 2px;">398</span>

\* (Cl added/replaced traps in the morning and moved a line of 10 into an abandoned, grass + shrub filled corral surrounded by a rock fence -)

We heard a bat fly high over camp in the late evening. It had high pitched clicks; a molossid?



Marcel L. Campbell

Bolivia  
1991

Journal

30 July

Wind picked up again last night & was blowing strongly this morning. Still fairly warm. Moon on western horizon at 7:30 a.m. I caught 4 animals along the stream on my line this morning, including a *Bolomys* and an *Oxyecherus*. Out of the 10 traps in the old corral I caught 4 animals, for a total of 8 off my line.

Total animals 30 July (c.m.)

MCC	Akodon	1	} along stream
	<i>Bolomys lacteus</i>	1	
	<i>Calomys</i>	1	
	<i>Bolomys</i> <del><i>Oxyecherus</i></del>	1	
	Akodon	2	} old corral
		2	
SGH	Akodon	2	
KWD	Akodon	2	
	<i>Phyllotis</i>	1	
OCS	Akodon	2	
	<i>Calomys</i>	2	
	<del><i>Phyllotis</i></del>	4	
JLD	<i>Oligoryzomys</i>	1	
	Akodon	1	
	<i>Bolomys</i>	1	
	<i>Phyllotis</i>	1	
EP	<i>Oligoryzomys</i>	2	
	<i>Calomys</i>	2	
	<i>Phyllotis</i>	1	
LASB	Akodon	1	
MDC/MCT	Akodon	1	

~8%

20 animals of 398 traps

30 July  
Tucumilka

Marie L. Campbell

Bolivia,  
1991

Journal

Prepped all day. The winds are much worse today, approaching the 50-60 mph gusts we experienced in Santa Cruz earlier this ~~month~~ summer. Most of the tents had to be dropped. We managed to keep the prep tent up but it was miserable to work in.

Syd, Santiago + Lila went into town in the afternoon to drop ~~the~~ Otto off at the airport. Otto goes back to Santa Cruz today for a week, then returns the 8<sup>th</sup> of August.

Jon, Frosty, Eduardo + I all leave for Santa Cruz the day after tomorrow, + from there to the States on 7<sup>th</sup> of August. Maria Dolores also leaves tomorrow for Santa Cruz, and Emma + possibly other students from Santa Cruz should arrive the 31<sup>st</sup>. The 1<sup>st</sup> of August also should be the day 5-6 students arrive from La Paz. After the rest of us leave Syd will be working with a crew composed entirely of Bolivian students.

Tomorrow we pack up camp + go into town, to await everyone's arrivals + departures.

30 July

Marcel L. Campbell

Bolivia  
1991

Tucumilla Journal

In the afternoon I went to check my traps. I had 1 Akodon in the old corral, but it escaped. It was one of the small species we have already trapped in abundance. I also caught a small green/olive water snake with a pale belly in the stream.

There are numerous tadpoles in the stream as well, but I haven't seen any fish. I did see a large Belostomatid water beetle which I imagine preys on the tadpoles & other aquatic insect larvae.

Possibly the water snake is also feeding on tadpoles. I didn't see any adult frogs, but I heard some calling. A very small species, by the sound.

We spent our last night in the field playing cards. The wind died down some after dark.

Total traps out 30-31 July

FWD 86

MLC 44

JLD 76

SGH 36

LASB 33

MDC/MCT 77

352 Shermans

Maniel L. Campbell

Bolivia  
1991

Tucumilla → Tarija Journal

31 July

Calm last night until ~ 5:30 am, when  
the winds started again.

Trap results 31 July

MLC	<del>4</del> 3	Akodon	} old corral
	1	<u>Calomys venustus</u>	
	1	<u>Marmosa</u> = rock ledge	
	2	<u>Akodon</u>	
	1	<u>Calomys</u> (small)	} "
FWD	1	<u>Akodon</u>	
SGH	3	<u>Calomys</u> 2 <u>Akodon</u> 1	
LASB	1	<u>Akodon</u>	
JLD	1	<u>Galea</u>	
MCT/MDC	-		

15 animals of 352 traps

~4%