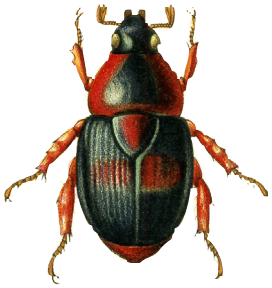

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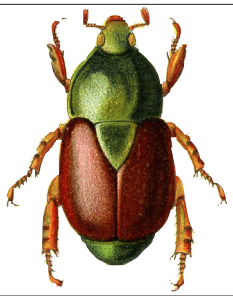

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Occasional Issue Number 20 Print ISSN 1937-8343 Online ISSN 1937-8351 August, 2007

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Killer Phileurini - or - How Come Some Diplos Are Hairy?

~~Dispatches~~ Speculations from the Diplo Desk - Part 4

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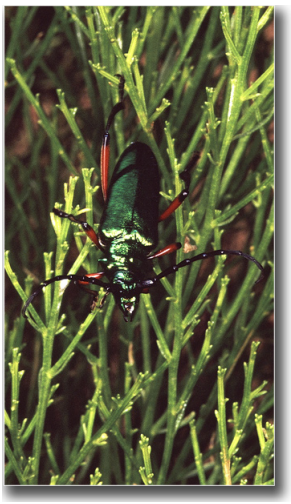
Have you held a living Phileurini (= "phileurine") in your hand? Are you sure it was alive? How could you tell? It pretty much did nothing, right? A few *Hemiphileurus illatus* (LeConte) have pooped a semi-liquid smear on my hand. But otherwise a live phileurine in the hand might be dead, except for the resistance they exert when you try to move something, like a leg. They are kind of like those iron-clad tenebrionid beetles that go catatonic when you handle them. Most scarabs go quiescent and tuck in all their appendages, but they soon begin to fidget and try to escape. Not the Phileurini. These are different beetles. They act like they are protected somehow.

The association of the phileurine species *Hemiphileurus illatus*, the cerambycid *Plinthocoelium suaveolens plicatum* (LeConte) and the living host of this beetle, *Bumelia lanuginosa* (Michx.) Pers., was reported by Linsley and Hurd (1959, *Bull. So. Cal. Acad. Sci.* 58 [1]:27-33), to wit, "In two cases scarab larvae were present in the roots, in one instance associated with the adult scarab, *Phileurus illatus* LeConte [=*Hemiphileurus illatus* (LeConte)], which had worked its way up a burrow in a root and destroyed a larvae of *Plinthocoelium*."

Mont Cazier, a student of predatory behavior in scarabs, and co-author M. A. Mortenson, noted (1965, *J. Kansas Ent. Soc.*, 38:1:29) that "This [see just above] appears to be the first and only record on feeding behavior in this tribe and indicates that on at least one occasion the adults may be predaceous."

In his review of my first version of this paper Doctor Art Evans, Ph. D. sent me a proof copy of his then in-press paper (1989, Evans, A. V. and A. Nel, Notes on *Macrocyphonistes kolbeanus* Ohaus and *Rhizoplatys*



Plinthocoelium suaveolens plicatum. Gleeson, Arizona July, 1991

auriculatus [Burmeister], with comments on their melittophilous habits. *Journal of the Entomological Society of Southern Africa* 51 [2]: 45-50) in which they reported on these two Phileurini as predators on bee brood in commercial hives in South Africa and Mozambique.

In 1989 Art told me of a mention in a large tome (title not recollected, published by Junk) on honeybees in which one American species, *P. didymus*, was implicated in invading bee hives. If true, then this native American beetle is an opportunistic predator capable of adapting to exploit the Old World honeybee.

Art also (2007 pers. comm.) informed me of another citation of predatory Phileurini (1997, Moron, M.A., *et al.*, *Atlas de los Escarabajos de Mexico*, Vol. I) where, p. 90 (my translation), *Phileurus didymus* (L.) "adults have been observed preying on other dynastines such as *Heterogomphus chevrolati* Burmeister whose abdomen was ripped open with the mandibles and fore tibiae to consume the visceral contents." Also, in the Moron volume I found another citation on page 88: adults of *Hemiphileurus dejeani* (Bates) "were observed attacking and devouring larvae of Passalidae and Tenebrionidae." No sources for these fascinating observations were given.

Hamlet and the Incredible Stinking Female All that follows flows from this single stinking specimen. It is remarkable how certain smells, both fragrances and stenches, lodge in one's memory. I got my first phileurine, a female of *H. illatus* (LeConte), out in what was mostly just open Sonoran Desert at a lighted billboard by a bar at Scottsdale Road and Shea Boulevard north of Scottsdale, Maricopa Co., Arizona, 1360 feet (415 m), on 17 July 1967. I pinned it on a Styrofoam block to dry. The block went into a desk drawer that provided protection from dust, but allowed air circulation. I expected this beetle to dry up for placement in one of the cigar boxes that housed my collection way back then. Even in the Arizona monsoon, beetles will dry. Three days later I got two males of the same species, and they dried up quite in the manner I approved of in beetles of this size—about 25 mm.

But the 17 July female refused to dry. Rather, she swelled up so that I could see the whitish membranes stretched tightly at both ends of her pronotum—it seemed that she could explode at any moment. However, the most remarkable thing was how she stunk. Putrid is not the word. Putrid with a sickening miasmatic fulsome sweetish element is closer—but still not accurate.

I was familiar with Shakespeare's *Hamlet* by then, and the line (act 1, scene 4) familiar probably in many languages, leaped to mind "Something is rotten in the state of Denmark" day after day as I checked this specimen. An unexpected whiff of corruption engages more than one's olfactory lobes. That famous line lodged in some neural nexus + that unique stench + this particular sort of

beetle. I never got the stink again, but phileurine beetles came again and again, accompanied by the line about corruption.

A seed was planted in my mind: Whatever could she have been eating? I had an early intimation right here that there was something interesting in the diet and behavior of these beetles. I was lucky that my first-captured member of this tribe proved to be so unusually aromatic.

Thus began a series of very entertaining little discoveries and mysteries and revelations that accumulated for over 20 years, one small observation clicking into place with another.

A Male H. illatus Caught With His Horn Wet Flash forward seven years to 4 July 1973: AZ: Cochise County, near Double Adobe, 4050 feet (1234 m). I was collecting in mid afternoon a series of that fabulous cerambycid beetle, *Plinthocoelium suaveolens plicatum* (LeConte) in a grove (actual trees you could walk around under) of their host bush/tree, *Bumelia lanuginosa* (Michx.) Pers. Suddenly, there under a board in the shade of the trees I discovered a male of *H. illatus* engaged in an unspeakable (for a scarab) act. The beetle was occupied with, and apparently eating the fresh remains of a lepidopterous larva of the smooth-skinned "cutworm" type, probably a noctuid. Only about 25% of the larva remained when the beetle was spotted with his wet head inside the flank of the larva. I wondered, did the beetle catch and kill the larva itself, or did it find it already dead? Small storms of seven-year-old electrical circuits reviving and new ones being created occurred in my momentarily arrested brain: that line from Shakespeare + that same species + the memory of that stink! It was suddenly dawning on me that this beetle could be a predator!

Adventures with Archophileurus Flash forward another seven years to 14 July 1980. On this date the late Lester Lampert showed me where (AZ: Cochise Co., 1.3 km W of Portal, 1481 m [4859 feet]) he had once (see just below) collected specimens of the flightless *Archophileurus cribrosus* (LeConte). I was eager to collect this species, so that evening at dusk I searched the vicinity of Lester's spot with a headlamp and over perhaps three hours I found three (one male, two females) rather widely dispersed *A. cribrosus* specimens crawling, with antennae extended, slowly and apparently aimlessly, over the mostly bare gravelly soil. It seemed they were… hunting for something. That line from The Bard echoed again. I do not recall now why I did not experiment with my three *A. cribrosus*. But Editor Rich saved my bacon by doing an experiment himself.

Editor Rich, knowing of my interest, informed me of his experimental results (pers. comms. 1987, updated 2007) concerning *Archophileurus cribrosus*. On 29 August 1985, he collected three specimens of *A. cribrosus* at: USA: Texas: Brewster Co., Highway 90, 1 mile

Hemiphileurus illatus
Female (top)
Male (bottom)

Archophileurus cribosus
Female (top)
Male (bottom)

E of Alpine. A second label reads, "ex old cow dung 2 inches deep in soil." Also in the soil under the cow pie he found scarabaeine larvae he suspected were *Onthophagus gazella* F. When he put several of these larvae in a vial with soil and an adult *A. cribrosus*, the larvae had disappeared the next day, apparently eaten. It is likely significant that his three *A. cribrosus* were not just on top of the soil under the dung pat, as one would suspect if they were just seeking shelter: rather, they were down in the soil at the same level as their possible prey, the scarabaeine larvae.

The only other previously recorded U.S. state for this species is Texas. Paul Skelley kindly looked in the Florida State Collection of Arthropods (FSCA) and found two specimens (this is a New State Record for Lester) labeled "Arizona, Cochise Co., vic. Portal, 15-VIII-1976, L. Lampert, *running* on ground *daylight*." The emphases are mine: Is it possible that Lester got these specimens actually running? In daylight? How un-Phileurini-like on both counts! Also at FSCA Paul found another apparent New State Record: USA: "15 mi. E. Hope, Eddy Co., N[ew] M[exico], VII-25-1957, C. W. O'Brien."

Paul, in his thorough way, continues: FSCA also has a couple specimens labeled: "USA, Texas, Reeves Co., Balmorhea St. Pk., July 10, 1961, R. H.Arnett, Jr, and E. VanTassell, *crawling on ground in morning*." (emphasis mine). It seems from these records that *A. cribrosus* spends a fair amount of time, daylight or dark, wandering over the ground. We might note two things in particular from these labels:1) The data on the Lampert and Arnett/VanTassell labels serve to illuminate the behavior of this enigmatic species, and 2) I for one am puzzled about the lack of pitfall and/or carrion trap records for this species.

Phileurus didymus Caught Doing It Too Just a week after collecting the *Archophileurus cribrosus* specimens I had another curious encounter with another phileurine species. While running lights with Peter Jump 17 km southwest of Moctezuma, Sonora, Mexico, 944 m (3097 feet), 21-22 July 1980 I noticed in the beam of my headlamp a specimen of *Phileurus didymus* (L.) silhouetted in an unusual posture on a horizontal limb of a large leguminous tree. The beetle was standing erect upon all six legs with its pronotum arched downward and its mouthparts apparently pressed to the limb. On closer inspection on tip-toe I discovered that the beetle (a female) had its mouthparts in contact with the central portion of the remains of a smooth-skinned lepidopterous larva. Both ends of the larvae were present and still connected. About half of the volume of the larva remained, with the open, injured surface in contact with the beetle's head. This additional species + that line + the memory of that stink added another layer to the emerging pattern.

Phileurus truncatus and The Incredible Lightness of Being Although innocent of experimental protocols, from late June until nearly the end of October, 1981, I kept notes of observations and experiments with four Arizona *P. truncatus* (Beauvois). All four were housed in one "Skippy" brand ™ glass peanut butter jar, about 850 ml volume, 86 mm inside diameter at the top, slightly smaller at the bottom. The lid with air holes was retained and used. Various substrates to give the beetles both traction and cover, including soil, paper toweling, and polyethylene foam were tried early in the experiment and rejected as unsatisfactory. I soon settled on a quantity of size 0, never-used, black rubber stoppers - enough to fill the bottom quarter of the jar about three layers deep. These gave the beetles excellent traction to burrow at will. I kept the jar at head height on a shelf above my desk.

In what follows you might wonder "Why did he manage to see so little of the actual action?" I finally concluded that the beetles 1) Preferred to work in the dark; or 2) Did not care to be observed, perhaps especially in such artificial conditions; or 3) Did not like me; or 4) More than one of the above; or 5) Something else?

Once, back at home in Douglas after a spectacular night of blacklighting with the "The Most Grandiose Editor" in: USA: AZ: Cochise Co., Huachuca Mts., Miller Canyon, 1630 m (5348 feet), 22 July 1981, I put one or two living scarabaeoids of several genera in eight of the same size 850 ml jars with damp soil in the bottom, each species having its own container: 2 *Polyphylla decimlineata* (Say), 2 *Parabyrsopolis chihuahuae* (Bates), 2 *Chrysina beyeri* (Skinner), 2 *C. gloriosa* (LeConte), 2 *Ancognatha manca* (LeConte), 2 *Coscinocephalus cribrifrons* (Schaeffer), 1 *Orizabus clunalis* (LeConte) and 1 *Pseudolucanus mazama* (LeConte), plus 1 male *Phileurus truncatus* (Beauvois). I also gave the occupants of each jar a disc of a wiener about 10 mm thick. I observed them for a couple

Phileurus didymus (Female)

Proofreader Sonja at Scarabs headquarters. Quote: "Jennifer and I love working with Mr. Diplotaxis. We both adore super-intelligent older men. Scott's sense of humor is admirable, and he never gets upset when we replace all those double dashes (- -) with commas. Note that we did not proofread the Letter to the Editors at the end of this issue."

Phileurus truncatus
Female (top)
Male (bottom)

days, waiting to get some insight from what they did. They all did something: ran or walked around their container, tried to climb or fly out, or sat quietly, at least when I was watching. Nothing very interesting happened, but the *Ch. beyeri* and *Co. cribrifrons* were so frantic they had to have some paper towel pieces or each would grab onto its jar-mate in a tangle. All ignored the piece of wiener except the male *Phileurus*.
This little exercise was a test to see what each of these eight species would do with a disc of wiener. All of the other beetles entered my collection, and the male *P. truncatus* went into the jar with two females collected earlier. They were already wiener-wise.

Noel MacFarland kindly supplied the first specimens, two females collected at his home in Cochise Co.: Huachuca Mts.: Ash Canyon, 1554 m (5098 feet), 25 June and 4 July. Bill and I then got that first male 22 July in Miller Canyon. And I later got a male in Santa Cruz Co.: Pajarito Mountains: Pena Blanca Canyon, 1191 m (3907 feet), 30 July. As specimens were collected, they were added to the jar - first the two females, then the first male, and then the second male. One female died on 31 July, the other on 23 August. The first male died on 10 October, and finally the second male died 25 October. All expired specimens were surprisingly light in the hand; I should have fed and watered them better. The learning curve was kind of steep for me. All those wiener pieces (see below) probably contributed.

Even though the two females died rather early in the experiment, the two males seemed not inclined to scavenge their bodies, in contrast to the female of another species.

On six dates all of the beetles alive on that date were offered water in a shallow pool in Annie's kitchen sink. Invariably they seemed to drink while standing in the pool by arching their pronota downward so that their mouthparts were submerged for periods of up to 15 minutes. I arbitrarily decided that was long enough, but now I wonder if that was not long enough, as no beetle ever indicated it was done by lifting its mouthparts out of the water. I did not think of submerging a mirror under them to try to see the mouthparts working. They never refused a "drink." No obvious movements of mouthparts were observed, and they could have finished drinking in perhaps the first minute, but these are singularly inexpressive and stodgy beetles. They seemed distinctly heavier in the hand when removed from the sink, so I presumed they had drunk enough. Clearly, access to water or abundant dietary liquids is important to them.

Many food items were offered. There was no planning involved. I just gave them something Annie and I were eating, or whatever I caught in the yard or something I brought home alive from a collecting trip. The only rule I (usually) followed was to put in one thing at a time after the beetle(s) seemed done with the previous item.

Items offered included sections (discs ca. 8-10 mm thick) of Oscar-Meyer All-Beef Wieners™. The beetles used a lot of energy attacking these inappropriate items. They worked at them with their clypeal horns, even with the lights on, worrying off granular bits that collected on the bottom of the jar. I always liked these wieners because they had an especially aromatic smell. Possibly the beetles were attracted to the aroma? Maybe I was just kind of stupid, as they seemed to actually consume very little, if any, of the sections.* I recorded an amazing total of nine wiener offerings. On one occasion I hung a disc with a string almost out of their reach. (I recalled the great Jean-Henri Fabre doing something like this with some of his Provence beetles.)

The incredible Jean-Henri Fabre

My beetles stood on their hind legs and reached up against the side of the jar and worried the disc until it came free from the string; this seems to show a well-developed olfactory awareness. I was excited just to see them do something! Then they worried it into dry crumbly bits. Late in the experiment I gave the two remaining specimens (males) a longer section of wiener, about 40 mm long. The next day I found the section with a

**Editors Note: Perhaps the beetles were commenting on the nutritional value of the Oscar-Meyer weiners.*

Proofreader Jennifer in the Recreation Room of Scarabs headquarters. Quote "It is an honor to work with Scott on these Dispatches. For a man whose body was chiseled in the image of a Greek god, he has remarkable humility. Compared to my bosses (Rich, Barney and Bill), Scott is a man among boys. Sonja and I look forward to establishing an even closer relationship with this remarkable genius in the future." Regrettably, Proofreader Jennifer removed several paragraphs from this article and has refused to return them, emphatically stating: "I know in my heart that Scott meant his poetic prose just for me to read privately...I don't care if you fire me, they're mine and you can't have them back!" Readers: Don't worry, Jennifer will always have a place at SCARABS.

longitudinal laceration along most of one side. One of them had apparently grabbed it in a sort of beetle desperation and fury, with all six legs and had gone the length of it rooting with his clypeal horn. It was like he was trying to open a monstrous larval cadaver for more suitable provender than that offered by the cut end of the section. Also, compare this mode of attack with that executed on the conspecific male and the cockroach mentioned below. It also had other apparently random gouges. I believe now that these beetles have a stereotyped attack method: to attack with their clypeal horns until a membrane is breached and they sense more-or-less liquid tissue, and then they feed. The aromatic wiener pieces I think were sensed as being of some sort of meat and therefore likely edible, so they attacked. But since they never broke through to any wet and yielding interior, they were stuck in the attack mode. Thus the hours, and even days, of continued attacks on the wiener portions.

Other kitchen meat items offered, with results, in sequence, were:

✳ Raw hamburger. A small wad was stuck to the inside of the jar just out of their reach. Unlike the suspended-by-a-string wiener disc they seemed to ignore it. When moved down within their reach, they were soon at it. Rather than tearing it apart with their horns, they pressed their mouthparts into the wad. Later the entire wad seemed to have been consumed, as no fragments were found.

✳ Raw bacon. They soon attacked it with their clypeal horns. Later it was reduced to small pellets of fat, all the leaner portions having disappeared.

✳ Fried ham. I observed one beetle working at it with its horn. Most of it disappeared.

✳ Cooked beefsteak. This was soon attacked, and was later entirely reduced to minute dry shreds and bits, with little apparently consumed, rather like the sections of wieners.

Non-meat items offered, with results, in sequence, were:

✳ Part of the cap of a large mushroom. This was demolished in part simply by the movements of the beetles. I saw no attempts to eat it while the lights were on. A piece offered the next day was ignored. But why was the first piece destroyed? Were they exploring it for larvae?

✳ Small distal end section of a ripe banana with the skin on. It was ignored on the first day. On the next day one specimen was observed with its head and pronotum inside an excavation in the skin of the banana. On the next day the section appeared to have been partly consumed, the skin more or less empty of flesh, much of which was smeared around elsewhere in the jar and on the beetles.

✳ Small piece of cantaloupe melon. Part was possibly consumed, but much of it was

smeared around the jar. Possibly the beetles were simply trying to "drink" from the fruit. A later piece seemed to be ignored, perhaps they had "drunk" to the point of satiation. I detected a pattern whereby a new item was introduced and more-or-less demolished but apparently not eaten, but the next offering of the same sort was ignored. Could this reflect actual learning by the beetles? Thirst-satiation seems simpler.

Animals, all but one living, including vertebrates, including possible natural prey items, offered, in sequence, with results, were:

✳ Two sphinx moth larvae about 60 and 25 mm long. Later in the same day the smaller larva had been killed and partly consumed. Three days later all that remained of both were small fragments of dry skin.

✳ Two scarab larvae (probably late instar *Phyllophaga* sp.). Within about 15 minutes one Phileurus had found and attacked one of them. The sharp horn at the apex of the clypeus was used to rip upwards into the midsection of the larva while it was held down at 90° to the longitudinal axis of the adult beetle by both front tibiae. One *Phileurus* stood on its rear four legs and tore a partly consumed larva completely in two by spreading its fore-tibiae apart within the initial wound made by the clypeal horn; the external tibial teeth, and the notch between the two apical teeth, seemed to assist admirably in this attack.

✳ Two large black and yellow *Danaus* sp. butterfly larvae were offered one at a time. I did not know enough then to investigate whether these larvae were protected by noxious chemicals sequestered in their tissues. However, evidently the *P. truncatus* specimens were oblivious of the warning colors, and immune to any sequestered poisons. In the first offering, one beetle stood over the larva and reached down and "bit" the skin of the larva with some components of its mouthparts about a third of the way from the head of the larva and pulled up, lifting the larva partially off the substrate. The apices of the mandibles are very sharply acuminate, and that intrigues me, but the beetles already have the clypeal horn for opening specimens. What role do these sharp mandibles have in the beetles' tool kit? It seems doubtful, but could they be useful in slicing open *by spreading* the wound made by the clypeal horn?* One of our dynastine-studying colleagues will someday figure this out. Anyway, the larva reacted vigorously to being "bitten" and lifted; later this victim was found in two pieces and partly consumed. Later the second larva, which had begun to pupate, was offered, and the next day it was torn apart. Two days later only bits of skin were left.

✳ In mid-August a large black hairy caterpillar was offered; it was apparently ignored. Later in the same day an even larger very hairy pale caterpillar was offered, and it likewise was apparently ignored. These prowled the jar more or less constantly. Some days later, both of these still-vigorous larvae were released into my yard apparently unharmed. I was disappointed—

**Editors Note: WAS (Wild Ass Specultion) Alert!.*

only later making some inferences from the survival of these larvae. I did not reflect much then on the fact of the mystery of these rare survivals from the *Phileurus* jar.

✳ A live baby spadefoot toad (*Scaphiopus* sp.) ca. 25 mm nose–to-vent was introduced, with no immediate interest shown. Next day the toad had entirely disappeared, including the skull and other bones, except for a single scrap of skin.

✳ A large (ca. 50 mm) very recently deceased neuropteran of unknown genus was offered. One beetle shortly found it and began apparently feeding at the distal end of the abdomen. About an hour later the only intra-specific agonistic incident occurred (see below). The next day the abdomen and the posterior portion of the thorax of the neuropteran had been consumed.

✳ Two acridid long-winged grasshoppers were offered. One was a recently-caught very powerful all-green one about 70 mm long; these go flying across my yard in a fearless and noisy level flight, and they are hard to catch. Three days later it was apparently unharmed. The next day it was dead and the two remaining males were observed with their heads buried inside the thorax of the victim, one on each side. This was the only time I saw two beetles sharing an item that was a whole and recently-living organism. The next day the grasshopper was reduced to fragments, the thorax broken and cleaned of tissue. The head was reduced to two fragments, each of which consisted mainly of the intact bulb of a compound eye. The hind legs and abdomen seemed undamaged. A smaller long-winged acridid grasshopper was offered later, and it was noted after four days as having lost the distal half of its abdomen. Later on the same day I found one of the beetles with its head inside the thorax of the victim. Later the same day it was largely consumed.

✳ Three large (ca. 70 mm) and heavy adult *Brachystola* lubber grasshoppers. These are strong animals, and they kick and bite! Over the course of four days two of these were introduced in sequence and killed and consumed by the last two beetles. The third grasshopper was offered much later, and it survived longer, but was eventually consumed after it died, apparently from confinement.

✳ One large (ca. 30 mm) *Stenomorpha* sp. tenebrionid beetle. This genus lacks the defensive glands of some tenebs. It was ignored for 14 days, at which point I released it. I suspect it had no weak point for the scarabs to attack, especially as the *elytra are fused*, which could have prevented an attacking beetle from using its clypeal horn to spread the elytra. Only this beetle and the two earlier hairy caterpillars survived the *P. truncatus* chamber of horrors.

✳ One small (35 mm nose-to-vent) live *Sceloporus* sp. lizard. The next day it was found dead and largely consumed. Only a few scraps of skin attached to the

back legs were the major fragment remaining; even the tail had disappeared. Later these fragments largely disappeared; I could not find the skull when I searched for it.

Hemiphileurus illatus and the Jars of Death Back at the same locality in Sonora in the dry season, Peter and I collected (10 June 1982) six individuals of *H. illatus* in the daytime in the leaf axils of a small native palm, probably *Erythaea roezlii*. It was Peter's idea to explore the intimate recesses of the palm; I had no notion that something macroscopic might be living down there. Like all of the phileurines that I know, *H. illatus* is dorso-ventrally flattened, but how they managed to get deep into these leaf axils, without being crushed or even leaving a discernible track of wounded plant tissue, plus no evidence of what they were doing in there, was wonderful to observe. We did find other insects, including some lepidopterous larvae about 25-50 mm long, but none in close proximity to the *H. illatus*. All of the tissue they were in was fresh and green, and without any dead or corky or woody parts: we would hack and pry apart the bases of the leaves with a machete, and there would be an adult beetle! Perhaps they enter from inside the trunk of the palm? We got six, one of which was badly crushed and discarded. All were put alive in a cold ice chest until I could study them.

On 12 June all five *H. illatus* specimens in cold but apparently good condition were put into a gallon (ca. 1900 ml) jar. After two hours I discovered that the only male was mortally wounded and was being cannibalized by one of the females. His abdomen was ripped off, and the tergites and sternites partly separated from each other in two fragments. These fragments, and the thorax up to the constriction behind the pronotum and the genital capsule were apparently totally cleaned of soft tissue. How she had managed to glean all apparent tissue down to the bare chitin puzzled me a lot, especially: How did she clean out the genital capsule?

When discovered in her outrageous act, the female, attacking from above and behind the male, had her head and forebody buried in the male, with his elytra and flying wings spread about 45° from the longitudinal axis of the body. The fact that this is a reversal of the normal mating posture did not escape me, and added to my wonderment, with perhaps a little chauvinistic outrage. Did he get to mate with her first? The male was feebly still moving his front legs. Oh! The horror! Are *H. illatus* females the more opportunistic sex, eating any superfluous males and perhaps thereby ensuring the production of healthy eggs? Or is this perhaps a species-specifc activity? Just an artifact of captivity? Recall how the males of *P. truncatus* apparently ignored the moribund bodies of their female jar-mates.

Later, I wondered about how the other three females had kept their distance from the devouring female: Were they not hungry? Or was this evidence of a dominance hierarchy? To prevent further cannibalism

Editor Bill's Note: In the late 1980's then coworker Jim Hunter reared five Hemiphileurus illatus from potting soil/mulch in a containerized mesquite sapling he had bought. Jim proudly brought the perfect, newly emerged specimens into work in a jar to show me. I related Scott's tale of cannibalism, spread elytra and empty abdomens, and suggested to Jim that he separate the specimens. Apparently he did not, as the next morning at work, Jim related that when he looked at the jar that morning there was only one live H. illatus left, the others all dead with their elytra spread open and their abdomens ripped open (via the tergites) and now empty.

the four females were separated into jars of ca. 225 ml volume. Substrates of rubber stoppers and lids with air holes were used. I kept notes over the next week (12 to 19 June). I summarize here the items offered, the results, and other interesting stuff. For all you diplo lovers—finally, here comes the good stuff!

All four females were offered two live *Diplotaxis* specimens each. I often have extras of these! The diplo species were of a similar size, about 10 mm long—*D. cribulosa* LeConte and *D. knausii* Schaeffer. I was rather careless of experimental protocols: there were five *cribulosa* specimens, but only three of *knausii*. I cannot explain this lapse. These two were just species I had at hand. While *cribulosa* is abundantly hairy on all parts of the body, with really long hairs, *knausii* is generally lacking obvious setae except for a single line of very fine marginal hairs on the elytral epipleurae. Some of the *H. illatus* ploddingly pursued their diplos (species not noted) for days, butting or hooking at them with their clypeal horns, while some seemed to ignore theirs. I was unable to determine if any of the females actually killed any of their diplos. When I noted a diplo was both dead and being ignored I removed it. Over the course of the week, all three of the glabrous *knausii* were consumed, while none of the five very setose *cribulosa* were consumed. Indeed, a single *cribulosa* specimen survived alive until the end of the experiment. Alert readers are thinking "Another little mystery!" A possible cause for this apparent immunity from attack for the hairy *cribulosa* specimens emerged later. At the time I just assumed they tasted bad or had better luck or superior evasive tactics.

The three consumed *knausii* specimens all exhibited similar forensic remains. They were reduced to fragments, variously still articulated or separated, with only chitinous parts and the flying wings remaining. Even the head capsules were largely consumed, reduced to the portion from the bulbs of the eyes forward. Microscopic examinations revealed curiously pitted and eroded edges of the thick walls of the capsule, as if a *strong acid* had been employed.

Other items offered were one adult field cricket (*Gryllus* sp.) which was apparently killed, and consumed. After three days one live subadult field cricket was consumed except for the usual fragments. All four females were given a piece of raw sirloin beef-steak, about 25 x 12 x 12 mm. Three females soon started apparently feeding on their sirloin pieces, but one was still occupied with the immature cricket. The next day all four were occupied with their bits of beef. Hollows had somehow been excavated in the pieces that accommodated the head and part of the pronotum of each beetle. Soon afterward I removed the bits of beef as decomposition was advancing and the beetles were becoming fouled. At this point (14 June, three days into the experiment) the first-

introduced items, the eight diplo specimens, were all still living.

One large and recently captured and fully-hardened and very active, uninjured cockroach (*Periplaneta americana* [L.]) was given to one female at 10 p.m. Forty-five minutes later when I returned and turned on the lights, the beetle had killed the cockroach and had it pinned to the substrate with her head and forebody buried in the thorax of the roach from above and behind, forcing the tegmina and the flying wings apart at an angle of 45° from the longitudinal axis of the body. This is the same posture of predator and prey noted when the male *H. illatus* was cannibalized. Remember, once is a coincidence, twice is a pattern. This might be a standard attack posture for these beetles. Something waiting to be discovered is how Phileurini manage to catch and pinion and kill such large and active prey items. On 19 June the four females were killed and mounted. I forget now why they never got any wiener sections. At this time I concluded my researches in the tribe.

SOME AFTER-THOUGHTS

Where Did All Their Poop Go?
In the experiments I never noted any trace or accumulation of feces, liquid or solid, or any associated smell. The *H. illatus* experiments lasted only eight days, and all four females were vigorous when I killed them. Still, from the amount they ate, there should have been some fecal residue. Even if it were liquid, I should have noted that in some way, especially as I have noted that this species uses its feces in a defensive manner, when first captured and later when being handled in my experiments.

But the *P. truncatus* experiments lasted four months, and they ate and drank a lot of stuff. When I had occasion to clean the jar, as after the mushroom and fruit offerings, there was never any apparent fecal portion in the mess, and I do not recall that they poop defensively. In retrospect, it is astonishing that the two male beetles could consume those two large *Brachystola* over just four days, and I now think that I had actually starved them. And perhaps their deaths were due to dehydration; if females have need for extra moisture, perhaps for producing eggs, this could account for the females dying much sooner than the males. Anyone planning experiments with this tribe might want to investigate their excretory habits: Do they just metabolize all solid matter into their own substance? How do they sequester or otherwise handle toxic waste products? Do they possibly sequester poisons for their own protection?

The Phileurini seem odd in another way that may be related: Check your specimens for the sort of damage from apparent predators that scar many scarabs; my phileurines are almost without such injuries. However, I have a female *Phileurus* sp. collected in the Mexican state of Nuevo Leon that stands out starkly in

this regard. She is missing both middle legs, and the left hind leg seems to have been bitten off just past the trochanter. This is a severely disabled specimen: Did the attacker get enough of a toxic shock from the three nibbled-off legs to desist? Anyway, the question of what they do with all the stuff consumed leads us to…

Why Were They Always Thirsty? I was repeatedly surprised by how readily the *P. truncatus* specimens drank in the sink. Their lightness in the hand before, and their heaviness afterward, also struck me. Some of the observations of their feeding, including how they seemed to feed by just sticking their mouthparts against or into the food item, lead to the inference that they feed by ingesting liquid food directly. To ingest solid food I infer that they employ a form of *extra-oral digestion*: they regurgitate a digestive solution that dissolves solid food so that they can then imbibe the resulting soup. Remember the partial heads of the diplos with the shells of the eyes left, and the eyes of the 70 mm acridid grasshopper, and how the bulk of the head capsules seemed to have been dissolved? Also remember the "dissolved" pockets in the raw sirloin pieces, and the pocket in the banana skin, and all the missing bones from the two vertebrates, even their skulls?

How does one account for the fact that often a tiny fragment was left—parts of insect heads, or a tiny fragment of vertebrate skin? That cleaned-out genital capsule? All those thoraces and other parts where only bare chitin was left? One explanation can account for *all* of this: A beetle would regurgitate its digestive solution onto smaller and smaller bits of matter until all that was left was just enough to contain a single droplet of the solution. Then the beetle would stop, as the next droplet of puke would dissolve the last tiny bit of solid material, and then both would be lost as they flowed away together on the substrate. The pieces of actual chitin were likely left because of the cost of dissolving these parts. There has to be a significant amount of evaporation with such extra-oral digestion, and this could also lead to the dehydration belatedly observed. The water budget of these beetles deserves careful study. Another issue has occurred to me: Perhaps they need a lot of water to accommodate their feeding strategy.

The Fighting Phileurus On 22 August 1981 during the *P. truncatus* experiment there occurred the only agonistic incident I observed. This was the day I gave the three remaining specimens the large neuropteran. The female died the next day, and was very light in the hand, so I doubt that she was one of the combatants. That would leave the two males. About an hour after the introduction of the neuropteran, while I was working, with the jar of beetles right there at head height, I heard a clattering commotion in the jar. Now, the substrate was the rubber stoppers, so any sound would have to be from the beetles striking each

other or the glass of the jar. I missed whatever caused the initial noise, but there was a slight pause, and then I saw one beetle driving the other *very rapidly* up the slope (perhaps 40°) of the stoppers, a distance I estimate as about 100 mm. They were positioned head to head throughout, and my impression was that they were using their clypeal and possibly their head horns as the aggressor drove the other uphill and backward with a very rapid series of clattering blows of the horns as the aggressor's pronotum was flexed down and then extended up so fast as to produce a rattle as their armaments engaged. There may also have been very rapid side-to-side parrying. I believe the retreating beetle was similarly exercising his armament. The agility of their footwork on the uneven rubber substrate and the whole-body agility and dexterity with which they maintained their head-to-head posture was wonderful, and the transformation from the Buddha-like solemnity I had observed before was astonishing. When the upper beetle could retreat no further, they stopped. How and why did the attacking beetle know to stop, rather than plowing ahead and overturning or tossing the retreating beetle? All of this "attack" sequence suggests a species with unexpectedly acute senses and finely modulated impulses. Then for several minutes they stood motionless head-to-head, once again inscrutable, impassive. Is this subsequent face-off part of this behavioral set? Maybe Lester did see his *Archophileurus* "running on ground daylight"!* The speed of the encounter was the most amazing element. Clearly they can do this on very steep and irregular terrain, such as on the limbs or trunks of trees.

What were they fighting over? The most apparent motives were access to either the neuropteran or the female. Since the female died the next day, I suspect it was the neuropteran. One of the beetles was observed very shortly before the fight feeding on the distal end of its abdomen.

The Wiener-Packing Papas Have you ever wondered about the cephalic pocket that many male Phileurini possess? The female pockets of some species may be non-functional. The sexual difference strongly suggests that there is a function for the male pockets. This cavity is present in many species. In the Arizona fauna it is especially developed in the largest (ca. 35 mm) species, *P. truncatus*, slightly less so in the medium-sized (ca. 25 mm) *H. illatus*, and not even present in the smallest (ca. 15 mm) species, *A cribrosus*. It often extends back under the anterior margin of the pronotum, forming a pocket partially protected by the overhanging edge of the pronotum. As this pocket is located directly behind the clypeal horn and recessed between and below the dorsal surface of the eyes, it would seem that juices or fragments of food items, funneled between the two head horns, would naturally tend to collect

**Editors Note: Running on the ground might be expected behavior, given that Archophileurus is flightless. Or, perhaps the ground was hot and their toes were burning...*

there under conditions that the beetles likely have some control over. Also, this cavity is usually the shiniest and least punctate structure on the external surface of the beetles. Parsimony strongly suggests there is something adaptive about these pockets.

Toward the end of the *P. truncatus* experiment another singular event occurred. On 23 August the last female died. On 22 September I made a wiener offering. On the next day the beetles drank at the sink, and I had the opportunity to offer them the lizard and a lubber grasshopper. These live items were eventually consumed, but on 24 September I noted that these live items were being ignored, and both males were working on the piece of wiener. I wondered, "Why would they frustrate themselves with the wiener bit while juicy living prey were present?" Then I noted an astonishing change in both males: They had *tightly and densely* packed their cephalic pockets with pinkish wiener debris: This was clearly no accident. Only later did I think of a reason for this wiener-packing.

Cephalic pocket of a male Phileurus truncatus

As pure speculation, it seems possible that this remarkable structure and its contents may provide an *olfactory* signal to females that a male has been feeding and therefore may be in superior breeding condition. Even more speculatively, its contents could provide a small *nuptial meal*. What about the remarkable smoothness of the pocket? Perhaps this smoothness might 1) somehow assist the female to consume the contents, and 2) the smoothness may also reduce any erosion of the surface of the pocket from the female's digestive juices.

These facts tend to support the "nuptial gift" interpretation: 1) Both males were ignoring the lizard and the grasshopper, while similar live items earlier seemed to be preferable. 2) Two beetles had "fought" on 22 August, suggesting they were in good condition and feeling competitive. 3) There had been no female in the jar for over a month, so perhaps packing their pockets on 24 September was an attempt to attract more females. 4) Late September in the southeast Arizona mountains is quite late in the season for any chance for reproduction. Much of this did not occur to me until after the end of the experiment, and I did not note how long they carried their packets in their pockets, or if they renewed them. Or, how they got the tightly-packed debris out of their pockets. Also, one might wonder "Why would wiener bits be preferable over other more natural items?" Perhaps the aromatic quality of this brand of wieners played a part. And 5) I did not observe this behavior in *H. illatus* because the only male died at the start of that experiment.

Why is it that I have never collected a male specimen of any species with a cephalic pocket that had any apparent dirt or debris in its pocket? Is this because it is cleaned periodically by females he is courting? I searched for, but found no ducts in the pockets

themselves that might connect with his pharynx for pumping an acid cleaning solution into the pocket to clean it. I suspect real experiments will reveal some surprises with this cephalic pocket, which will qualify it as a genuine organ if my observations are confirmed: In an animal or plant, a part having some specific function.

Hairy Stories Remember how the five hairy *D. cribulosa* were spared by the *H. illatus*? Do you remember how the *P. truncatus* ignored the two very hairy caterpillars? So, what did you come up with? It was not until much later that I saw a possible connection. Hairy caterpillars are notorious for their urticating (and possibly-obnoxious-in-other-ways-to-lots-of-creatures) hairs, and the two I offered to the *P. truncatus*, and which they declined, likely were of this sort. I should have gotten those caterpillars identified—just another goof-up. How would noxious hairs affect these beetles? Do they have to be "stung" or otherwise discomfited to desist? I do not know, but I doubt it. Avoidance of organisms with a certain aspect of hairiness is possibly in the phileurine genome.

Here is a bit of irony: Think of all those *hairy scarabs* out there. Hairiness pops up in many genera, including genera with glabrous species. Why was there selective pressure to produce and preserve these hairs? Species recognition? To collect dust to dull a shiny exoskeleton? To collect condensation? Sensory functions? A means of broadcasting pheromones? Deflecting air currents? Obscuring the dorsal outline? What else? I know of no adaptive use of their hairiness for any of the hairy diplos. I just want to plant this seed of thought out there: Maybe hairy scarabs are, in some cases, *mimics* of protected caterpillars? Think of those billions of nasty stinging caterpillars out there, crawling over the ground with impunity, climbing the stems and trunks and foliage of plants: These models for an adaptive imitative gambit are legion. As with innocuous species (mimics) that use the aposematic colors and patterns of distasteful or stinging species as a strategy of deception, could some scarabs use their hairiness as a form of Batesian mimicry? It is in the dark when hairy scarabs are usually active, crawling over the ground, climbing the stems and trunks and foliage of plants too. In the dark a hairy diplo probably feels to many potential predator very like a nasty hairy caterpillar. Do predators have to be hurt by every noxious hairy creature they encounter, before they learn to desist? Probably no more often than visual-hunting daytime predators have to be stung or injured to leave aposematically-colored animals alone. Avoidance of noxious hairy creatures is probably in the genome of many creatures. How cool would that be: Hairy diplos as mimics? Deceiving killer scarabs?

Some skeptic out there is objecting right now, "How come all scarabs aren't hairy, if this is such a great

V-shaped Tibial Notch
Phileurus truncatus
(female)

U-shaped Tibial Notch
Phileurus didymus
(female)

tactic?" It likely has to do with the balance between mimics and really noxious model species: The protection fails when there are too many mimics relative to models. Some really clever and thoughtful ecologist is going to study (among innumerable factors I cannot even imagine) the balance of hairy scarabs and likely models in north to south transects across, say, a state of Mexico. My impression is that hairy diplos increase from north to south, and from higher elevations to lower ones. Doesn't this seem to roughly match the distributions and numbers and diversity of noxious hairy caterpillars?

Tibial Notches—V-Shaped or U-Shaped? Remember how one captive specimen of *P. truncatus*, after opening a scarab larva with its clypeal horn, then inserted both fore-tibiae into the wound, spread the tibiae apart and actually tore the larva into two pieces? This larva was almost certainly a novel prey item, but the fact that the larva came completely apart caused me to reflect on "Would this be a good or a bad thing for *P. truncatus* in a state of nature?" Since the beetle can only attend to one half of such a larva at a time, it seems likely that the other half would be lost, especially if phileurines commonly do their hunting on tree trunks and limbs, as I observed in the *P. didymus* attack: Rip a larva in two up there and half is going to roll away.

Cazier (1939, *Bull. So. Cal. Acad. Sci.*: XXXVIII: 169-171) cogently noted in his key to the U. S. Phileurini that the species *P. valgus* (Oliv.), (cited as *P. castaneous* [Hald.]), has a U-shaped emargination between the first two anterior tibial teeth. The sides of the emargination in *P. valgus* are quite parallel, not diverging. The other three U.S. species have a V-shaped emargination. One could simply assume that the unusual U-shaped emargination in *P. valgus* is a quirk of evolution and is not necessarily adaptive. But the U-shaped emargination also occurs in the much larger Mexican *Phileurus didymus*. There it is again, that twice-is-a-pattern business. I also have four specimens of an apparently new Mexican species very like *P. valgus* (one male, three females) except the male has different genitalia and it is also unlike *P. valgus*, in that all four specimens have a V-shaped tibial notch.

This difference--a U- or V-shaped emargination between the two apical tibial teeth--suggests that there may be some adaptive significance to the shape of this emargination. Let's assume that the usual mode of attack for adult Phileurini species is to rip a hole in the side of a larva with its clypeal horn and then, after feeding for a time, to open this wound further with a spreading action of the foretibiae. Let's also assume that each species has a suite of prey species that are different from the suite of prey species of other Phileurini species. Perhaps the shape of the tibial emargination is adapted to the more optimum style of opening these wounds, reflecting

the thickness of the cuticle, or the sizes of (or some other feature) the suites of prey species. Would a U-shaped emargination tend to prevent a complete dissection into two halves as I witnessed in the attack on the scarab larva by the captive *P. truncatus*? Recall the *P. didymius* on the tree limb in Sonora. Its prey larva had not been torn in two, and it has a U-shaped emargination. Or perhaps the U-shaped emargination may provide a better no-slip grip? Or maybe the U-shape is a better weapon for spreading the elytra of hard-bodied prey, with the U-shaped slots each engaging the sutural edge of an elytron? It is axiomatic that species with similar needs partition the environment in complex and interesting ways, and perhaps these different shapes of fore-tibial notches reflect just such specializations. The clearly distinct size classes of the three Arizona species suggest a possible similar partitioning of the environment by prey sizes.

Curiously, these U-shaped emarginations are lacking in the illustrations of both *P. didymus* and *P. valgus* in the Moron *et al*. volume. Is this a cline, where U.S. and Sonoran specimens have U-shaped emarginations, but they gradually change to V-shaped emarginations further south, or just faulty illustrations?

The Effect of the Phileurini in the Environment We have a huge realm of ignorance on how Phileurini make their living. They *seem* to be very thinly spread in the environment, as they are usually collected in low numbers.* Some seasons I have gotten four specimens at light on one night, and then none for the rest of that year. I believe, mainly from observations and cogitations concerning diplos, (see 2006, *Scarabs* 17: 11-22) that some, perhaps many, scarab species are reluctant flyers even though they do at times fly to lights. I have collected, mainly in southeastern Arizona and northwestern Mexico, for nearly 40 years now, and I believe I have never failed to collect every phileurine I met. I have about 95 specimens—that is less than three a year. I suspect that these beetles are far more numerous than ordinary collecting techniques reveal.

Consider 1) How voracious my captive specimens were, 2) How rapidly, nimbly and fiercely they can move to attack at least conspecifics, and 3) The astronomical numbers of noctuid and other smooth-skinned larvae in phileurine-inhabited environments, not to mention other potential prey. Also consider 4) Something that is different about many of the smooth-skinned lepidopterous larvae: They generally do not stay on their food plants, but rather they secrete themselves during the day in the leaf litter and such cover, and then at dusk they make a trek back up their food plants. Gardeners (like myself) know that finding dispersed individual cutworms in the daytime is kind of unusual even when they are present in large numbers. Doesn't this pattern just invite the evolution

**Editors Note: Predators are less common than their prey.*

Phileurus valgus

Calosoma scrutator

Editors Note: Readers may find the following web site interesting: http://www.beetle-experience.com/care-valgusl.htm

of a predatory class to exploit these juicy larvae by positioning its members at dusk on tree trunks and limbs to assess the passersby? Could these scarabs be the nocturnal scarab version of the mighty diurnal carabid caterpillar hunter, *Calosoma scrutator* Fab.? In habitats where both are found, this could be a splendid example of habitat-partitioning! The role of the Phileurini as predators is only barely glimpsed. What niches in the environment are safe from these ravenous beasts?

Phileurini as Insect Zoo Candidates These are easy and clean beetles to keep. There are lots of science fair projects here. These beetles need a professional advocate: someone with the appropriate facilities to observe them under real experimental conditions. Infrared light would allow far more penetrating observations than I half-accidentally achieved.

I hope you come forward with your own adventures, perhaps in the pages of this newsletter. Who will tell your stories if you do not? Will they die with you? A love of stories is in our genome, and every one of us who passes on diminishes us all and a big part of that loss is the stories that were never shared. Soon after Frank Hovore left us one of his long-time friends, Lisa Lee (Pat Sullivan's wife), said in an e-mail:

One is inclined to think about what one passes on when there is so much passing on going on.

I thank all the colleagues and friends mentioned above. Foremost is my trophy wife and devil's advocate Annie Piedmont McCleve. She has let me play with beetles our forty-four years together. I thank Charles Riley (now of Green Valley, AZ), a colleague at Douglas High School for 29 years and best friend for even longer, and who often collected with me, sometimes with his son Bill, and who let me collect beetles in his *Bumelia* grove. I thank Peter Jump (now of Ventura, CA), and also a colleague at DHS, for many years of friendship and fellowship on uncounted collecting trips.

Editor Bill's Note: It is interesting to note the many similarities that seemingly make the Phileurini the "dynastine equivalent of the Cremastocheilini." These include:

- *dorsoventrally flattened, usually black bodies*
- *expanded mentum (presumably to protect mouthparts from prey)*
- *usually simple, pointed mandibles (externally tridentate in some genera such as Goniophileurus, Trioplus, etc.)*
- *relative rarity in the field (compared to phytophagous relatives)*
- *death feigning when disturbed*

“Hey baby, guess how much meat I’m packing.”

National Science Foundation Funds Scarab Research

Brett C. Ratcliffe and Ronald D. Cave have just been awarded a grant by the National Science Foundation to conduct a five year biodiversity inventory of the Dynastine Scarabs of Mexico, Guatemala, and Belize. This research will provide the first extensive documentation of the taxonomic, geographic, and temporal distribution of dynastines in these countries and will provide the means to identify, for the first time, all species. Collections in the USA and study area will be surveyed to gather data associated with specimens, extensive collecting will be conducted, and new species described. Authoritatively identified collections will be established at institutions in all three countries. The research will contribute to the development of organizing and accessing knowledge about insects, and it will promote the infrastructure for future biotic surveys. The result will be an illustrated book-length work on the Dynastinae of Mexico, Guatemala, and Belize that includes an introduction to the three countries, identification keys (in English and Spanish) for all species, and detailed species accounts. Users of the monograph will be students and scientists working with dynastines, ecologists needing identifications, and park and reserve managers needing to know the faunal composition of areas they control for establishing management plans, educational programs, or research opportunities. The study area is biotically rich, but it is also an area of increasingly intense land use where pristine areas are succumbing to "development." In order to manage resources in developing countries, we must first identify the fauna. The recognition of the importance to humankind of tropical forests and the mounting concern for their future is well known. Basic research in the tropics must be accelerated, and failure to do so will limit our capability to contribute solutions to impending scientific and human problems.

This will constitute the third volume in a series of five that are planned. The first volume surveyed the dynastines of Costa Rica and Panama (http://www-museum.unl.edu/ research/entomology/dynintro.htm), and the second volume covered Honduras, Nicaragua, and El Salvador (http://www-museum.unl.edu/research/entomology/Honduras-book.htm). The fourth volume will inventory the West Indies, and the fifth will treat the United States and Canada.

In Past Years - II - Ecuador

by Henry F. Howden

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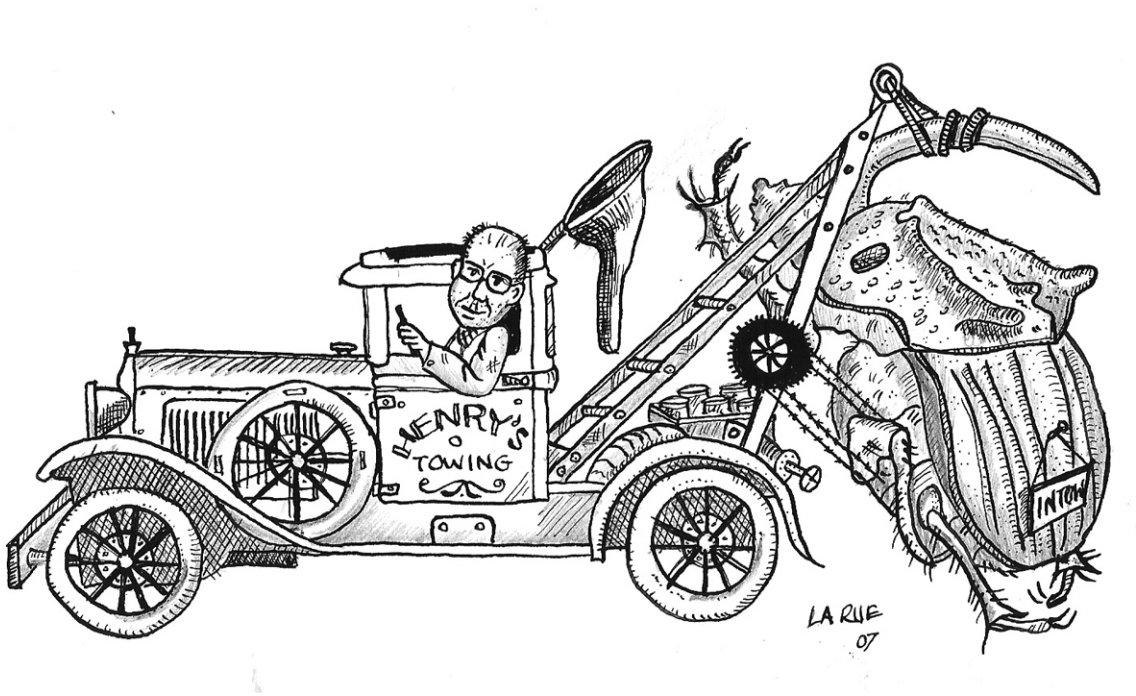

Artwork Courtesy Delbert LaRue.

After our Amazon excursions, a number of students still wanted to see the tropics during Spring Break. Considerable time was spent looking for a place that could house and feed at least 25 people at a reasonable cost; we finally settled on the Rio Palenque Field Station, 47km S. Santo Domingo de los Colorados, Ecuador. The station, while not as plush as the one at Leticia, was surrounded by a small patch of lowland forest near the west coast, a rarity in that part of Ecuador. Near the end of the 70's we twice took a group of 25 or 26 people.

Only one incident worth reporting happened at the station in the two years that we were there. In a downed palm tree several large weevil larvae (*Rhynchoporus palmarum* L.?) were found. Anne asked the kitchen staff (three ladies) if she could borrow a small pot to boil some water. The water was brought to a boil and the larvae were then placed in the water for three minutes to preserve the larvae. When Anne then transferred the larvae to a jar of alcohol the kitchen staff were obviously upset. It turns out that the weevil larvae are a favorite food in parts of Ecuador and the staff expected to see us eat them! We did not try to explain what we were going to do with them.

Nothing much else happened. There were a few muddy bottoms from falling in the mud, and some people grumbled about a fairly

steady diet of rice and beans, but most of the excitement occurred going to and from the station on one or the other of the two trips.

In flying to Quito, we found the airport was not the easiest place to reach. Quito lies in a bowl surrounded by high mountains and in the final approach the flight path curves around a hill just before putting down. If not lined up properly, the airplane will wind up in town. On one trip there were fairly thick clouds and the plane spent some time circling. We could catch glimpses of the city directly below us, but the pilot decided to divert to Guayaquil on the coast.

We landed in the hot sun shortly thereafter and were off-loaded to a "waiting room". There was nothing to do and we were told to stay in the room. Since we were much closer to Rio Palenque than we would be in Quito, I asked if we couldn't unload and get a bus to the station. I was told our tickets said Quito and that was where we were going as soon as they could get a new pilot. The one we had, we were told, was new and just didn't have the experience (guts ?) to land at Quito. Hours later a new pilot turned up, we returned to Quito and landed safely. Perhaps, some of us thought, due to luck as much as skill. We were about 5 hours late.

Fortunately, our bus was still waiting for us and we were off for the three hour drive to Rio Palenque. After three hours it was dark and we couldn't see the landmarks for the dirt road turnoff to the station. Eventually we found someone that knew of the place. We then drove over a very poor dirt road to the base of a hill just before the station where the bus got stuck. We had to unload everything and carry it all up the hill to the station, one unhappy and tired group. The bus driver, when he finally got unstuck and turned around, said he would not come in on that **road again but would meet us at the highway on our return to Quito. The station manager said he had a truck to get us to the highway, so we said OK.

Come the morning we were leaving, supposedly at 8 AM, it was pouring rain and there was no truck. About 9 AM we were told the truck had broken down and the manager hoped to get another, smaller, truck; it might take our luggage, but we would need to walk the two miles to the highway in the rain. So we changed back to field clothes and waited with some of us starting to walk to the highway to make sure the bus waited for us. Finally a small pick-up appeared, was loaded and we all left for the highway. The bus was there, our luggage was loaded and off we went toward Quito. Time: a little after 10 AM; boarding time at the airport 1 PM; normal travel time from station to Quito 3 hours. I told the driver if he got us to the airport before 1 PM an extra $20 was his - not a good idea if one wants a safe drive on a mountain road!

There were more challenges than just time. We were all in wet, muddy field clothes and needed a change. So after some consultation,

girls went to the back of the bus and changed while we made sure the driver's mirror was not aimed at the back of the bus. Then the guys had their turn to dress in the back. Finally we all looked somewhat more presentable.

However, we had forgotten that it was Carnival time and that balloons filled with colored water were a favorite missile. When passing through a small settlement several balloons hit the bus; it was suggested that everyone on the curb side close their windows. One person said it would make the bus just too hot and our previous experience with the water throwers showed that their aim was poor. Need I say more. In the next town the first balloon thrown came through the open window and hit the non-believer in the side of the head. Fortunately there was little spatter, but one person now had a cool (wet) white and purple shirt.

The rest of the trip went well, passing on curves and high speed did not cause any major disaster and we arrived at the airport a little before 1 PM, and I was $20 lighter. But that did not end the excitement. The airport was jammed, passports were waved with $ bills sticking out, and the ticket taker said he had no record of our group of 26 people! For a short time things got very hairy. We then found one of the people that had reconfirmed our flight at head office and, surprise, the ticket agent found that our group was indeed listed for the flight. After that and once we had boarded and taken off, the rest of the trip back to Ottawa seemed dull; thank goodness! On our way back, Anne and I decided that THAT was our last group trip with 10 or more people and our resolve has never weakened!

Wood art by Chuck Wirth (author of those "Wirthless Tips" in the ancient issues of this newsletter), now of St. David, Arizona. We are not quite sure exactly what the message is, but like the subject matter.

Letter to the Editors

Are Chupacabras Real???

Dear Editors:

On my 1984 3-week trip to western Mexico I took some cans of sardines for baits. I thought--well, the fish are small and the air will get to them quickly, and they already stink. So if I open the can their essence will permeate the environment. This was down in lowland Jalisco where we found a little road that took us pretty well back into a spot with big fig trees, vines you could swing on, pools of water in the streambed, stuff like that. Well, it did--I mean permeate the habitat--and attracted some kind of mammalian scavenger who cleaned out the can and crapped on my pitfall setup and left very strange paw prints. The next night (same place) I just poked some little holes in another can of sardines with a nail, and again I attracted another scavenger. Maybe the same one--like it thought these were training sessions? Or free lunch? This trap robber, though, threw a ferocious fit--I guess at not being able to extract the contents through the nail holes. There was some really awful thrashing around in the vines and stickerbushes in a little clearing--you know those legume ones with the bullshead thorns that those nasty, nasty, ants-from-hell live in? Well, one of those little stickerbushes was chewed off at the ground, and 2-3 others sustained a powerful lot of damage. (The ants were still looking for someone to punish the next day.) We were afraid to get out of the camper or even shine a light off that way during all the rip-snorting. It sounded like it might be a whole pack of those fabled chupacabra devil-monsters. One of our 3 light stations was demolished, bulbs broken, sheets just torn up into several pieces and wrapped around tree trunks and tangled in brush. The cord from the generator to one other station was totally chewed through--there was a perfectly horrible tortured-animal scream when the chupacabra's (what else could it have been?) teeth bit into the copper wires and the animal's head started flashing blue and orange lights and making a harsh electrical buzzing sounds--like, "Uuunnnzzzfttth! Hhhhhschhhwunnnnzzz! Passshaaatttzzaaarrraaazzzmm!" There was a potent musky singed-fur + liquid feces animal stink all the rest of the night. It (they?) slunked off into the thickets, and did not reappear--but we did not dare even to check the lights until daylight after the sun was well up. The sardine can had lots of fang marks in it--and there was some blood and tooth fragments visible when we turned it over with a stick. Made the hair on the back of my neck and on my arms tingle! We left there as fast as we could--I never saw my folding shovel again. And we did not do any more carrion beetle trapping with the little-holes-punched-in-sardine-cans method. If you do, try not to do it in chupacabra country.

(Name withheld at writer's request)

Editors Note: We apologize for all the unsightly double dashes (- -) here. It is our policy not to proofread letters to the editors.

Editors Note: Not since the Jimmy Carter "Swimming Rabbit Incident" have we seen a small woodland creature (such as a coati mundi) strike so much fear in an ~~anonymous~~ adult human being.