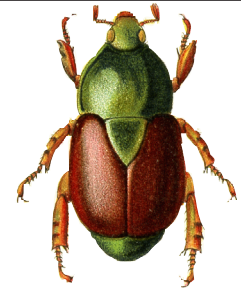


SCARABS



Yete ga hōdi, koogon

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WITHIN THIS ISSUE

Nematodes on Scarabs ... 1

Post-Processing Beetle Images..... 5

Dynastes granti..... 11

In Past Years XV 12

Gymnopyge 19

Rarest Scarab Story Festival..... 20

BACK ISSUES

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Worms on My Scarabs

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The author being sweaty but EXTREMELY HAPPY in a scarab shop during a collecting trip to Japan.

Writing this article I am well aware of the fact that many of you will hate me for what I am doing. I collect nice scarabs all over the world and then I cut them in pieces. "But why should/how could anyone do that?" you might ask. Well, I have to admit that this is not easy for me as I really love

beetles, but it's my job. I am looking for beetle-associated nematodes and the group of nematodes I am working with occurs mostly on scarab beetles.

The genus *Pristionchus* is one out of 28 genera in the nematode family Diplogastridae. Most of



The European chafer *Melolontha melolontha* - still feeding and having fun.



Cut *Melolontha melolontha* (not so happy anymore) on a Petri dish with nematodes crawling out and around (now THEY are having fun...).

the diplogastrid nematodes are known to have an association with certain insect taxa. *Mickoletzky* for example can be found on bark beetles, *Parasitodiplogaster* on

fig wasps and *Cephalobium* in crickets.

In 1996 my boss established *Pristionchus pacificus* as a satellite system for comparison with probably the best-studied animal on earth: the nematode *Caenorhabditis elegans*, or *C. elegans* as most *C. elegans* researchers call their lab animal. For many years *C. elegans* and *P. pacificus* were used to compare molecular mechanisms concerning cell fate, cell-cell interaction, molecular pathways and stuff like that. After some time the scientists wanted to move from this macroevolutionary approach to a microevolutionary approach, *i.e.* compare different strains of *P. pacificus* and/or closely-related *Pristionchus* species with each other.

The problem was that no one had a clue at that time where to look for new strains and species of *Pristionchus*. All strains of *P. pacificus* (six at that time) and other species of *Pristionchus* (five) had been found in randomly-taken soil samples. And it was fairly unpredictable how many soil samples you had to look at to find a *Pristionchus*.

So to be frank, people did not know anything about the ecology and biology of *Pristionchus*. That's when I joined the team. As there were some hints that there might be an insect (and in particular a beetle) association my boss contacted and hired me to look at potential interaction of *Pristionchus* and beetles.

To make a long story short I could indeed show that our beloved nematodes sit on beetles. And thankfully enough they don't sit on dull and boring beetles but ON SCARABS!!! I did collect (and sacrifice) thousands of scarabs from all over the world. Probably my karma is completely f---ed up*—but I could expand the *Pristionchus* species list from six to 23 and the number of nematode strains to over a thousand. Our most wanted species *P. pacificus* seems to be the only cosmopolitan species. We now have more than 100 strains from all over the world, and with molecular tools in hand we can do fancy things like trying to find out how the species got spread all over the planet. We cannot only see a biogeographic pattern in *P. pacificus* but in the whole genus *Pristionchus*. There is for example an American clade of *Pristionchus* species comprising *P. aerivorus*, *P. pseudaaerivorus*, *P. americanus*, *P. marianneae*, *P. pauli* (named after the *Phyllophaga* guru Paul Robbins), *P. sp. 3*, *P. sp. 16* and *P. sp. 20*. These are mainly found on Melolonthini (several *Phyllophaga* species but also *Polyphylla*).

But what do these nematodes do with the poor scarabs? They are neither parasitic nor phoretic. We call their life style necromenic. They sit on the beetles in a larval stage that is called "Dauer." This larval stage does not feed (has closed mouth parts) and has an especially thick cuticle that prevents desiccation. The Dauer



Abdomen of *Melolontha melolontha* and thousands of crawling nematodes.



A cup of *Amphimallon solstitiale* still alive and intact – waiting to help science.

larvae do not harm the beetles but simply wait for them to die. After the beetle's death (which I antedate by cutting it in half) the nematodes leave the Dauer stage, grow adult and start multiplying RAPIDLY. One single female can lay up to 300 eggs and it only takes 72 hours from egg to egg laying female. So after few days the whole beetle will be covered

*Editors' Note: We suspect this is a slang German term for "fouled up."



Exomala orientalis - the Oriental beetle - bears our beloved *P. pacificus*, both in Japan and the U.S.



Cutting these *Lucanus cervus* hurt me a lot!!!



Amphimallon male (confused) and *Anoxia* female (surprised) can carry nematodes.

in worms crawling around just like maggots on a bigger carcass. They feed on bacteria and fungi degrading the dead beetle.

We do find certain *Pristionchus* species in close association to certain beetle species. This led us to the question how the nematodes can find their hosts. We found out that these 1 mm small worms can indeed sense and use the beetles pheromones. In *P. maupasi*, e.g., which is associated with the European cockchafer *Melolontha melolontha*, the nematodes are attracted to traces of phenol - a known compound in the beetles' chemical communication. So given the fact that the association sometimes is very close (not necessarily species specific but at least genus specific), and the multitude of scarab genera, there should be many more undiscovered *Pristionchus* species out there on scarabs.

I would greatly appreciate if some of you could send me scarabs to check them for new *Pristionchus* species or strains. The beetles should be alive or at least freshly dead and not killed by freezing or any chemical because this would harm the nematodes as well. Please don't hesitate to contact me if you have any other questions.

Photography of Pinned *Chrysina*

Part II - Processing the Image

by the Editors

What follows can be applied to any scarab, or any beetle, for that matter. We apologize, as this is supposed to be a newsletter about scarab beetles. Even though this subject is definitely tangential to scarabs *sensu stricto*, we felt it important enough to sacrifice these pages to help those who may be struggling with the behemoth we call Photoshop.

Using Camera Raw

Once you have your image files transferred to your computer, you will want to process them in Camera Raw. On our Macs (sorry PC, our staff refuses to work on Windows computers - see Photo 1), we select the images and drag them onto Photoshop's icon in the Dock. As mentioned at the end of Part I, we hope you shoot your photographs in the Raw format because they contain the most information. Even if you do not have Raw files, you can (and should) open them into the Camera Raw Converter - a most powerful tool. To open a non-Raw image, simply boot Photoshop, select File -> Open... then select the file(s) and go to the little box in the lower left corner (Photo 2) and select Camera Raw.

If you have several images open that were shot under identical lighting conditions, you can open them in Camera Raw, hit the Select

All button in the upper left corner of the Raw Converter and process all these images together.

Referring to Photo 3, let's go through the sliders and make some adjustments. Most pinned scarabs are going to be photographed against a white foam pinning surface. The advantage to this white background is not much ink is required if the image is printed on white paper. The other common background is black velvet. Note that it readily shows dust particles. Remove them by dabbing the velvet with the sticky side of adhesive tape. When making adjustments in the Raw Converter, disregard the background and keep your attention on the specimen. If the background is splotchy, we can



Photo 1: Proofreader Sonja (see page 20 of this issue) is never far from her beloved iMac.

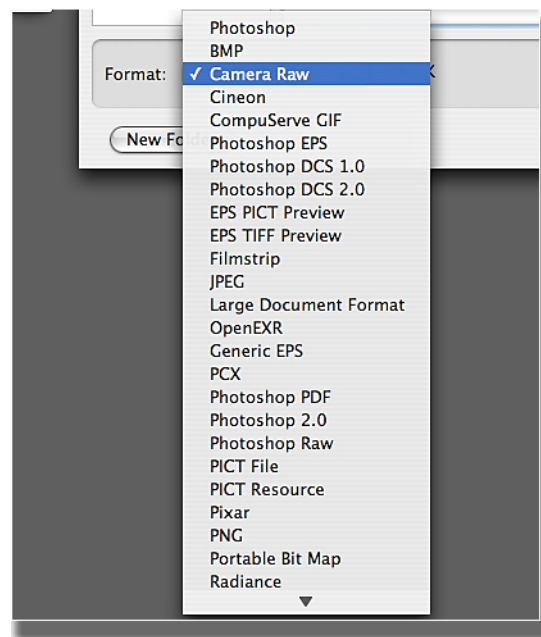


Photo 2: Opening a JPG (JPEG) file in Camera Raw.

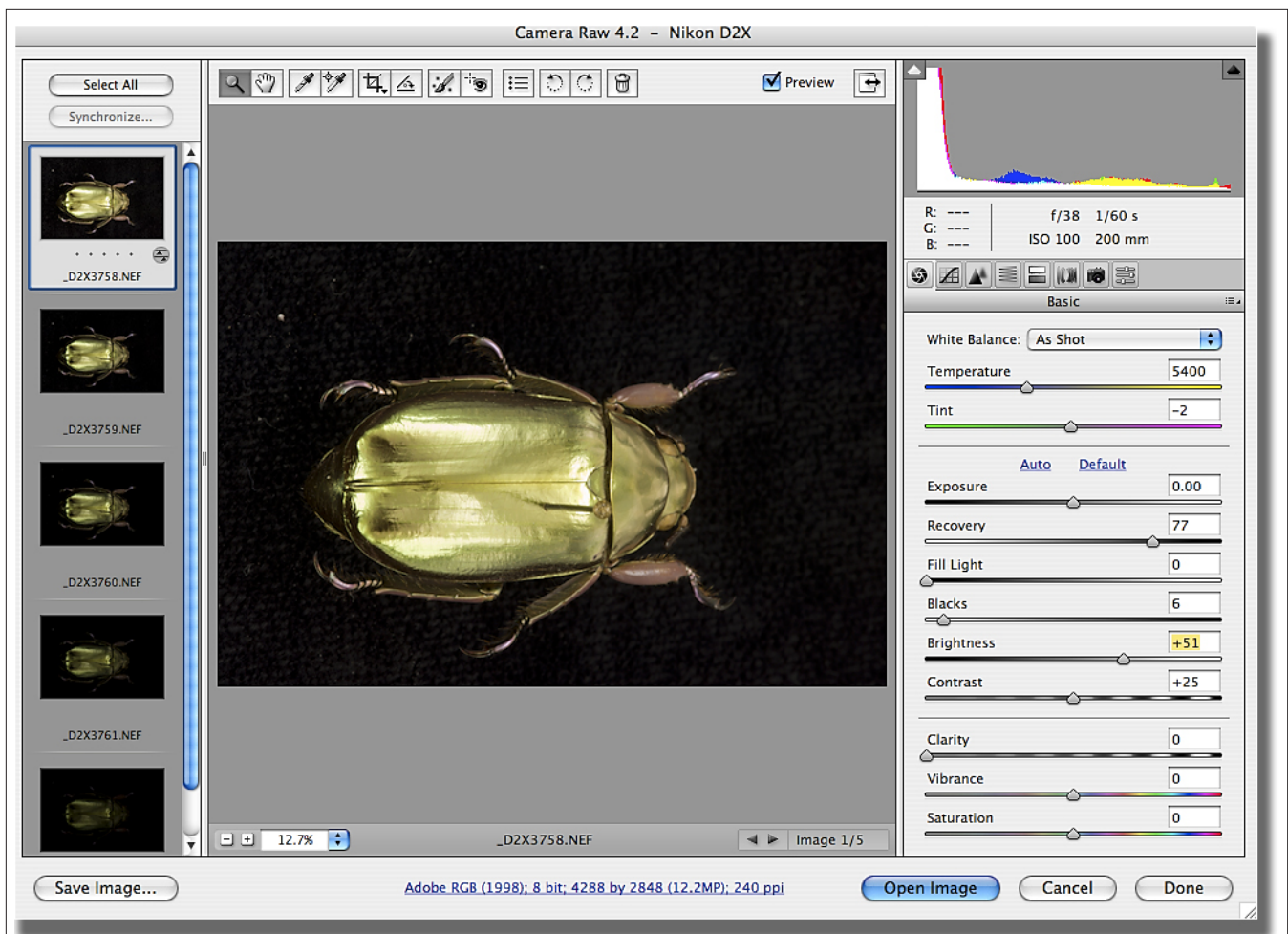


Photo 3: Adobe Camera Raw. This is a most powerful starting point for your photographs. Make it your friend!

easily transform it to pure black or pure white in Photoshop. This will be covered later in this article.

If your camera's white balance was set to flash (and you used flash as discussed in Part I), there should be no need to fiddle with Color Balance or Tint. If this did not happen, you can choose the light that was used to light the specimen from the White Balance pull-down menu.

While using the next group of sliders, keep an eye on the histogram. If you used a black background, you will see a big spike on the left side of the histogram. This is simply the black background. If the spike is all the

way to the left, that means there are areas of black that are so dark they hold no detail. That's O.K. because we don't want detail in the background. Conversely, a spike on the far right means there are areas with loss of detail (pure white) in the image. This is usually the white background, so this is permissible and desirable.

What we don't want are "blown highlights" (as they are called by photographers) to be on the specimen. To check for this, turn on the highlight warning by clicking on the small triangle in the upper right part of the histogram. Blown highlights (white with no detail) will now show as bright red. There should be no

blown highlights on the specimen itself, but it is desirable to have the white background blown. Remember, make your adjustments on the specimen and ignore the background.

Conversely, if you click on the little triangle on the upper left part of the histogram, you will turn on the shadow warning. Blocked-up shadows (black areas with no detail) will be shown as bright blue areas. Again, we don't want these on the specimen.

First, adjust the Exposure slider back and forth to fine tune the exposure on the specimen. Again, ignore what happens to the background. If you lighten the image and blown highlights (shown as red on the beetle) appear, slide the Recovery slider to the right until the blown highlights (red) disappear. Play with the Fill Light slider to see if it improves the image. Adjust the Black slider in the same fashion. If you go too high with it, you will get blocked-up shadows (blue) on the specimen. Adjust the Brightness slider up or down until you are happy. Do not touch the Contrast slider; a Curves Adjustment Layer in Photoshop does a better job. The Clarity and Vibrance sliders affect the image in a way that is difficult to observe unless the image is at 100% magnification. We usually set them both at 20. Do not touch the Saturation slider; it saturates areas that are already saturated with color. The Vibrance slider, on the other hand, saturates areas that are under saturated. This is highly

desirable.

The *Chrysina* in Photo 4 has several problems. There is a terrible orange color cast, as this scarab was photographed using tungsten light, and the white balance setting in the camera was set to flash. Setting Camera Raw's White Balance to Tungsten (Photo 5) solved the problem.

The next problem is that the

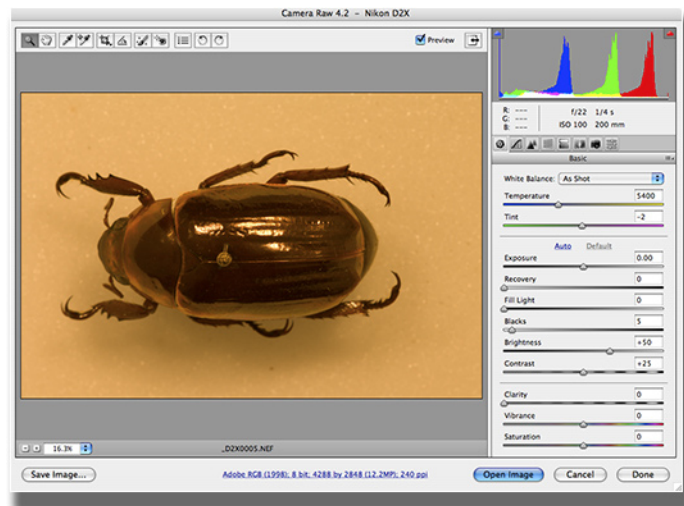


Photo 4: This *Chrysina* image has several problems: an orange color cast, the beetle is underexposed, and it is neither perfectly horizontal nor vertical.

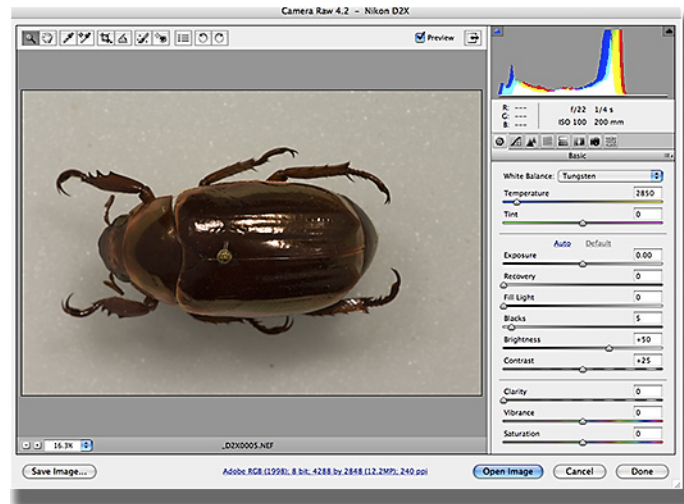


Photo 5: A simple change of the White Balance setting to Tungsten removes the awful color cast.

beetle is underexposed. Setting the Exposure slider to +1.40 (Photo 6) really helped. Notice on the histogram there are blown highlights that even the Recovery slider could not fix. These are the small specular highlights on the right elytron. Click on Open Image to bring the image into Photoshop.

Straightening the Specimen

If you have a horizontally-oriented specimen, you may as well make it vertical now (Photo 7) by going

to Image -> Rotate Canvas and choosing either 90° CW or 90° CCW.

The first task once inside of Photoshop is to make sure the specimen is perfectly vertical or horizontal. This is easily accomplished. First, let's make a duplicate layer of our photo and work on that. Press Command-J (PC: Control-J). Select the Ruler Tool, which is found with the Eyedropper tool. Position this tool (the center of the "+" sign) over the elytral suture at the scutellum. Click and keep holding the mouse button down. Now position the tool about 1/3 to 1/2 of the down the elytral suture and release the mouse button. Photoshop will draw a line over this part of the elytral suture.

Next go to Image -> Rotate Canvas -> Arbitrary, as shown in Photo 8. You will see a box named Angle: with a number in it. Click OK. Your specimen will now be perfectly vertical (or horizontal, if you shot the specimen horizontally).

Now crop your image to your liking with the Crop tool.

If you need to change the image size or/and its resolution, now is a good time to do it. Under the Image menu, choose Image Size...

Fixing Splotchy White or Black Backgrounds

The first step to fixing the background to add a new layer: Layer -> New -> Layer... In the dialog box that appears, give it

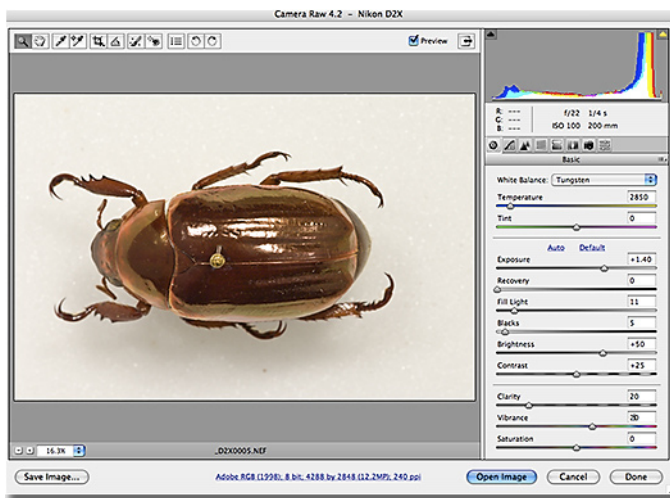


Photo 6: A simple push of the Exposure slider helped out not only the *Chrysina*, but the background as well.

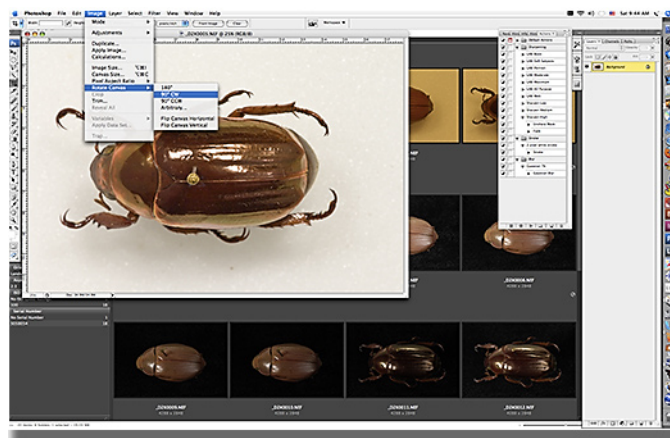


Photo 7: Rotating the canvas to a vertical orientation.

a name if you would like, set Mode: to Overlay, check Fill with Overlay-neutral color (50% gray), as in Photo 9. The 50% gray is transparent in the Overlay layer blending mode, which is why your photo looks the same. We will be making our adjustments on this layer.

If you have a splotchy black background, you will want to make it pure black. Select the Burn tool. In the Options Bar, under Range: select Shadows and for Exposure: select somewhere between 10% and 30%, as in Photo 10. Now click and drag over the light spots on the background. If your scarab is mid-toned, it should not be affected if you accidentally paint over it, because you have your Burn Tool set to only affect the shadow areas.

For lightening white backgrounds, use the Dodge tool. Set the Range: to Highlights and Exposure to 10-30%, as in Photo 11. Paint over the darker spots of the white background until they are pure white. Again, your specimen should not be affected if you paint over it.

Removing Unwanted Spots

Dust spots on the images can easily be removed by clicking on them with the Spot Healing Brush.

Removing the Pin

Use the Clone Stamp tool for this. The key to using this tool is to use a soft brush and to change the

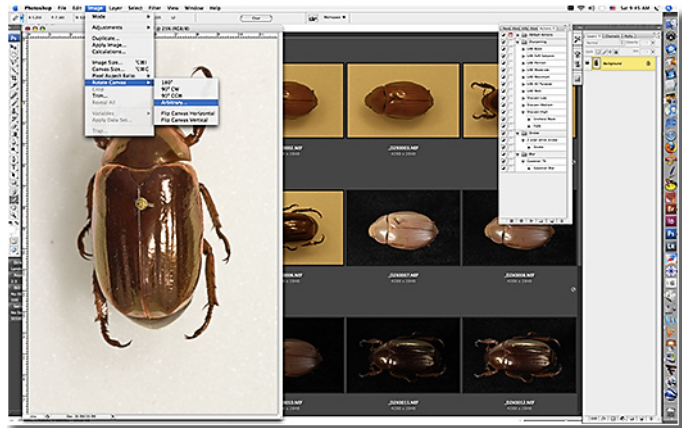


Photo 8: Straightening the specimen so it is perfectly vertical.

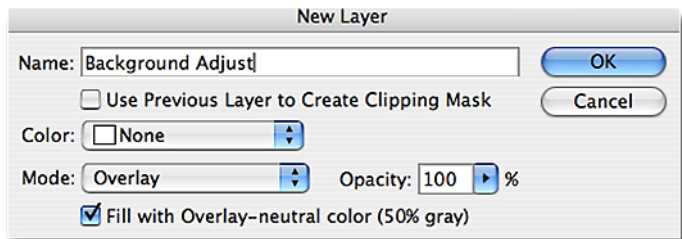


Photo 9: Creating a new blank layer to make our Burn or Dodge adjustments on.

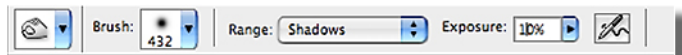


Photo 10: Options Bar settings for the Burn Tool to make a black background totally black.



Photo 11: Options Bar settings for the Dodge Tool to make a white background totally white.

source point often by Option (PC: Alt)-clicking on the area you want to clone from.

Sharpening

Sharpening the image should be the final step. For this, the sharpening sequence should be recorded as an action. This way, any time you want to sharpen a photo, you only need to click once. What we will do next is to record three actions.



Here is Jennifer with her Mac Pro and Wacom Cintiq graphics tablet. Besides helping Sonja with proofreading chores, Jenn does the initial layout for *Scarabs* and retouches every photo.

Each action will render in turn a minimal, medium and high amount of sharpening without altering the colors of the specimen.

1. Open any photo to use as a test. Make your Actions panel visible (Window -> Actions).

2. Let's make a folder to store our actions in. Click on the Folder icon (fourth icon from left) at the bottom of the Actions panel. Name it Sharpening and press OK.

3. Now click on the Create New Action Icon (fifth icon from the left), name the action Sharpen Medium and click OK.

4. To start recording the action click on the Begin Recording Icon (second from left).

5. Go to the Filter menu, under Sharpen choose Unsharp Mask.

6. Set the Amount to 85%, Radius to 1.0, and Threshold to 4. Click OK.

7. Immediately after clicking OK, go to the Edit menu and choose Fade Unsharp Mask. In the dialog box that appears, choose Luminosity in the Mode: pop-up menu. Click OK.

8. At the bottom of the Actions panel, click on Stop Recording/Playing button (first icon on the left).

Your test image should now be sharpened. To see the effect of the

next two sharpening actions, you may want to go to the File menu and choose Revert to bring it back to its original state.

Repeat steps 3-8, and call the next action Sharpen High. For step 6, set the Amount to 120%, Radius stays at 1.0, and Threshold to 3.

Repeat steps 3-8, and call the next action Sharpen Low. For step 6, set the Amount to 100%, Radius stays at 1.0, and Threshold to 10.

For most images, Sharpen Medium will work fine. Some will only need Sharpen Low. Sharpen High will seldom be used. If you don't like the look the action gives, you can get your original back by File -> Revert, which will bring back the file to what it looked like when it was last saved.

Remember too that a properly-sharpened image often looks bad on the screen, but will print beautifully. The key is to use as little sharpening as possible. Experience will be a great aid in choosing which action to use.

Once you have your scarab image opened, and have chosen which sharpening action to use, you only need to select the name of the action in the Actions panel by clicking on it, then click on the Play Selection button (third icon from left).

Remember to save your image and backup your files.

Dynastes granti Horn in Arizona

by the Editors



Dynastes granti Horn is a common scarab in central Arizona, less common in the southern part of the state. In the late summer, it feeds on branches of ash (*Fraxinus velutinus*) trees that are approximately one inch in diameter. The beetles peel away the bark by “plowing” into it with the clypeus, leaving long rectangular wounds.



The scars *Dynastes* creates can be seen at least a year later.



Here a female is shrouded with shredded bark.



This male is walking to another spot, as the branch he is on is wider than the preferred diameter used for feeding.

In Past Years - XV 1974-1975 Sabbatical

by Henry F. Howden

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From September 1974 to September of the following year we had our first sabbatical year. I had some support, both from our National Research Council and the Australian CSIRO (Commonwealth Scientific and Industrial Research Organization), to work on the Australian bolboceratines (geotrupines). There was a lot of planning and we wanted to find someone to stay in our house while



Photo 1: Canyon on Kauai; not easy collecting on ridges. Similar ridges with some native vegetation occur on Oahu.

we were away. Our “house sitter” turned out to be our friends Henry Townes and his wife; they were glad to have the chance to work on the Hymenoptera in the CNC and to collect in Canada. Our two eldest daughters were in the university and were due to join us in Canberra at the end of their school year in May. Our youngest daughter, Lucile, was able to take the second half of her high school year through correspondence courses, and went with us. We finally left Ottawa on December 10.

So, with our planning done, we went first to Hawaii with some tiresome stops along the way. For a capital, Ottawa was really in the backwoods at that time. We couldn't fly anywhere without a plane change either in Montreal or Toronto. Going westward, it was Toronto and we sat for most of the morning there waiting for our flight to Los Angeles. Then another long delay to connect to our flight to Hawaii. We finally arrived in Honolulu 19 hours after leaving Ottawa. Needless to say we didn't do much the next day except wander around near the beach and make a brief visit to the nearby zoo (zoos are one of our weaknesses). One cage that housed some great apes had a sign warning the public not to get too close because one of the apes had a habit of throwing things if bothered. One young man decided to ignore the warning and

threw something into the cage. He had it returned with interest - a hand full of fresh dung which was well aimed and hit him just below his chin. He left in a hurry! We visited the Bishop Museum, took a tour of the island, did some low-land collecting (Photos 1 and 2) which yielded a few nitidulids and tried to catch up on our time zones. After three days, we left for Sydney, Australia, with a short stop in Fiji. During the stop I collected several species of scarabs near the airport - no worry about security there.

In Sydney, we were met by Geoff Holloway, a friend from the time of the 1972 Congress in Canberra. He, his wife, Jan and son, Andrew, kindly hosted us during our stay in Sydney, Geoff helped us find a good used car that was in our price range. We had run into the usual problem that we couldn't take a "child" in a government car, even if she was in her next to last year of high school. So, instead of letting us have a government car, we were given a grant to buy one. With Geoff's help we found a car to suit our budget, a 1967 Holden Premier with 66,697 miles registered on the odometer; we had it inspected by the New South Wales (NSW) auto club (NRMA), and after a few minor things were fixed and insurance obtained from the auto club, we were finally mobile. Cost of the car with repairs and inspection was about \$1,400 Australian dollars. The most daunting part was following Geoff in our new car, driving on the left side of the road through Sydney's morning rush hour, south to the small coastal town of Gerroa. There Geoff had



Photo 2: Native trees on Kauai, typical of undisturbed areas.

arranged for us to stay at a beach house just outside of town at the north end of Seven Mile Beach, a long crescent-shaped beach (picture 3) backed by a protected forest and no houses.

We settled in, did some shopping, and started to learn the Australian version of English, such as "spinach" = Swiss chard, "chook" = chicken, "boot" = trunk of car, and so on. The area was rather dry, but the collecting was not bad; three species of *Onthophagus* were taken in traps and other scarabs came to light. Anne still remembers the revolving clothes line that squeaked when the



Photo 3: Seven Mile Beach south of Sydney, New South Wales.



Photo 4: Beach drift at Seven Mile Beach; not often are beetles so easy to collect in numbers!

wind blew, which was most of the time. The first day, near our house, I nearly stepped on a “black snake” which, I learned, belongs to the cobra family, along with about 70% of the Australian snakes - it is best to avoid all snakes unless you know the Australian species! Geoff was full of tall stories about snakes, spiders, etc., and had a gullible listener in our daughter, Lucy. After a day, Geoff went back to Sydney and left us to our own devices, which included collecting and exploring the nearby escarpment, with its wet forest.

We learned one thing: that all along the east side of the Great Dividing Range, where wet forest is found, there are “stinging trees” mingled in with the other species. Fortunately these stinging trees are not common and the leaves have obvious “hairs” that would cause anyone familiar with nettles to be careful. Unfortunately the trees can reach a size similar to many others in the forest, and when a leaf from a stinging tree is shed and falls on you, the result can be extremely painful and long lasting. The pain may subside after a day or so, but every time you get wet it returns and this recurrent pain may last for months. When we were in Australia, the chemical causing the reaction was still unknown.

We avoided most of the local “natural” hazards, but not bad weather. On Christmas Day typhoon Tracy essentially destroyed Darwin, and while Darwin was on the northern coast of Australia, the aftermath reached as far south as southern NSW a

few days later. Strong winds and intermittent rain changed our usual type of collecting from beating and digging to beach combing. Onshore winds blew thousands of insects onto the beach and the tide line was thick with beetles (Photo 4), if one got there before the birds. For two days we did little else; we kept notes on how many of each species we found, whether they were dead or not and density per yard. For Seven Mile Beach we estimate that there must have been several million insects washed up on the one seven mile stretch. The dominant beetle by far, was *Cyclocephala signaticollis* Burm., an exotic species from Argentina. Later a short paper on our findings was published in *Biotropica*, 1977, 9: 53-57. The discouraging part was that during our stay there we did not collect a single bolboceratine, although we were introduced to the infamous bush flies (Photo 5) which arrived along with the wind. More on these later.

We left Gerroa on the 2nd of January 1975 and drove up the escarpment to Canberra. There we were hosted by Ev Britton and his wife. The first few days were spent at the CSIRO looking over their extensive collection and, with the help of Murray Upton, finding out what was needed for field work in Queensland. Murray arranged for us to have the use of one of the CSIRO caravans (= house trailer). It did seem odd that we could haul a government trailer when we had our daughter with us, but not use a government car. So it goes. For several days while the car was being fitted with a trailer hitch, electric



Photo 5: Anne showing how easily she attracts insects (bush flies).

connections, etc., we collected locally, getting numerous dung beetles and melolonthids, but no bolboceratines.

Anne also encountered one of the less advertised Australian pests: a “bull ant”, which stung her on the leg while she was pulling bark. During our time in Australia, we came to believe that bull ants, with their nasty sting, were the major hazard to collectors in southern parts of the continent. They would come after you for no reason that we could discern, so one always needed to be



Photo 6: Emu; if semi-tame they can be a real pest or worse. Males can be aggressive, but can usually be scared away by holding your hands above your head and yelling to show that you are taller and louder.



Photo 7: *Eucalyptus* flowers; don't pass them by.

on the lookout for these miserable pests, plus a few others (Photo 6)

Once the trailer hitch was installed, we hooked up the caravan and took it up Black Mountain, a steep hill just behind the CSIRO buildings. It turned out that the caravan, with girders reinforcing the undercarriage and an extra large water tank added, as well as several other refinements for long stays in the outback, was too heavy for our car to pull! The result was a burned out clutch. So, no caravan and several extra days spent in Canberra before we headed north. The car, with a newly added roof rack, looked like one of those cartoons of an overloaded wagon. However, we did fit ourselves in and even managed to keep our collecting equipment handy. It was just as well, as shortly after we left, we saw eucalyptus with blooms that we could reach (Photo 7). After half an hour of “working” the blooms, we had collected several species of melolonthids, several cetonids and a *Microvalgus*, along with half a dozen species of buprestids and cerambycids. This first stop slowed down the entire trip, as every time we saw some bloom that we could reach, we stopped to investigate.

The second day we were passing through a fairly wet area when we stopped for lunch at a pull off. To my amazement I saw what looked like a geotrupine burrow in the middle of the packed gravel pull off. It was slow digging, since at first I had to use a hammer and screwdriver to get through the hardened surface; 10 inches

of digging turned up my first Australian bolboceratine, an *Elephastomus*. Joy, but no other burrows in sight, so we went on. We didn't make great time; not only was the occasional flowering tree slowing us down, the narrow, winding road did not encourage speeding. It took three days for us to reach Toowoomba, Queensland, on the escarpment to the west of Brisbane. Toowoomba was an interesting town with, at that time, some great entomologists, including Peter Allsopp, who worked (and still does), on scarabs. He took us to a small patch of rain forest (Photo 8) near Ravensbourne where we were introduced to land leeches. In that patch of rain forest we picked up several of the delightful animals (Photo 9). I then found a dead pig almost covered with fallen leaves. All around the leaves were moving: carrion beetle heaven! I was wrong, there were hundreds of leeches in the leaves. If there were any beetles, I did not stay to look for them. Later we learned that repellents such as "Off" would discourage most leeches.

The next day we collected in more open forest near Toowoomba and took several species of bolboceratines, *Elephastomus* and *Australobolbus*. The somewhat wetter weather definitely improved collecting. My dung-baited pit-fall traps were christened "Howden traps" by Peter or an associate, and this label lasted for a few years. Fortunately this label has now become extinct.



Photo 8: Peter Allsopp near wet forest containing some unwanted fauna.



Photo 9: The unwanted fauna - a leech with racing stripe (?) and more.



Photo 10: Forest near Lake Placid and Cool Waters Caravan Park, Cairns, Queensland.

It was necessary for us to move on, so we reluctantly left and moved northward to Yeppoon on the coast. There the motel we selected backed on to the local movie theater, although we didn't realize it at the time, but found out the first night! The "theater" had canvas sides which were raised in the evenings to let the cool(?) air in and the sound out. Every night we learned more than we wanted to about *Mutiny on the Bounty*. Fortunately, most evenings we were out collecting, so we were subject mostly to only the ending. Four days were spent collecting locally. Carrion and dung traps yielded numerous *Onthophagus*, plus many other beetles, and collecting on the beach or just behind yielded several species of tiger beetles. No bolboceratines were found, much to my disgust.

As we drove north toward Cairns, the road did not improve and just before we reached Townsville, a pot hole destroyed our muffler. So an unexpected overnight stop was made and the next morning the

expedition continued with a new muffler (and fewer \$). Arriving at Cairns, we found a caravan park called "Cool Water", the name, it seemed, coming from the fact that it rained most of the time we were there. Collecting locally was mostly at a place called "Lake Placid", a privately owned area containing a fairly level patch of lowland rain forest (Photo 10). The owners said we were welcome to all the insects, spiders, scorpions or any other pests we might find.

They had an interesting dog of a very mixed breed. The dog had been hit by a car that had broken its leg. While recovering, the dog received much attention and petting. Fully recovered, the attention vanished, much to the dog's dismay. So a solution was found, every time someone looked at the dog he developed a limp, at other times he was fine! Since we caught on quickly and didn't pet him, we were ignored - no limp.

When we visited Lake Placid it usually poured. A rain coat was no good; it was so hot and humid that one got wet either from rain or sweat. So wallets were wrapped with plastic and we just got wet. Dung traps, if covered with a rain roof, did very well. The tree trunk tiger beetles (*Dystipsidera* sp.) were interesting to watch. They would sit facing downward on the trunks of eucalyptus trees, often with a drop of water covering the mouth parts. I never saw them feed but they certainly could fly, or run to the other side of the tree. Beating was a great way to get

drenched, so the traps were the only really productive method of getting any number of beetles.

After several days of rain, we decided to become tourists and take a boat trip out to Green Island at the edge of the barrier reef. It was a good idea, but most of the other passengers on the boat got sea sick, which rather spoiled the trip for us. Once on the island, there was bright sunshine and one could see it raining back in Cairns (Photo 11). One lucanid found on the island was given to us, but otherwise we looked at fish from an underwater observatory and enjoyed the dry weather.



Photo 11: Green Island, Queensland.



A member of the characteristic spring fauna of low deserts of the southwestern United States and northwest Mexico, *Gymnopyge* are diurnal flower feeders. The genus presently consists of four species, difficult to separate because of weak interspecific differences, sexual dimorphism, and high intrapopulation variability in color, size, and pilosity. Pictured here is (apparently) *G. hopliaformis* Linell, 1935, on a preferred adult host, *Geraea canescens* Torr. & Gray. The data are: USA: California, Imperial County, Highway. 78, 4 miles west of Gecko Road, April, 1992, Barney Streit.

The Rarest Scarab You Ever Collected

by The Editors

Our third story fest is on! The rules listed in *Scarabs* #28 (June, 2008) have been thrown out! Tell us about the rarest scarab beetle you ever collected, even if it is just a paragraph or two. The deadline is November 30, 2008.

All those who enter will receive this autographed, high-quality 8 X 10 of Sonja (pronounced "sawn-ya") who is one of our proof readers. Don't forget to enter...getting a signed print of Sonja is now way easier than you ever imagined!

Editors' Note: This is no longer a contest, because everyone who sends us a story receives a portrait suitable for framing.

Note also that this is not necessarily about collecting a rare species. It can be about bagging that scarab that you always wanted (in other words, rare to you) or perhaps difficult to collect.

