Keeping Guides on Target
Enviroscope
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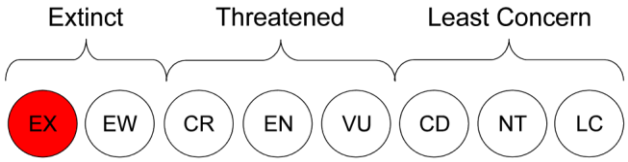
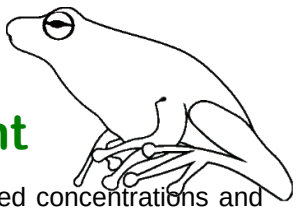
Naming the unnamed



I confess to being clueless when it comes to many of the facts and figures that are bandied around in conservation circles. On one DVD I hear E.O. Wilson (the eminent ecologist) saying that there may be as many as 30 to 100 million species on our planet. I hear another expert estimate that rates of extinction could be as high as one every 15 minutes! Are these figures right? Are they even in the right "ballpark"? Who knows – because I certainly don't? Nor apparently does anyone else.

One of the big issues revolving around these number discrepancies is that they are very hard to prove and more importantly – to disprove. Ecologists and biologists may get an artificial "boost" from this by playing to the public's fears and ignorance of the facts. If they overestimate the number of species thought to exist on the planet, then they have more leverage to argue for better protection of the planet. Don't get me wrong – desperate measures are sometimes called for!

Tagging along with this possible overestimation of global species diversity is the problem of a shortage of taxonomists - the people who are entitled to name new species. So far, around 1,5 million species have been named, leaving a possible 98,5 million still uncertain of their own identity. Knowing what species DO exist, allows us to put conservation measures in place, and that could prevent their demise. This is apparently why it is so important to know what actually does share this planet with us. Or is it? *Do we really need to know how many species there are in a forest before we decide to stop cutting it down?*



Frogs more sensitive than previously thought

A study[1] conducted in Germany recently shows that even when used at recommended concentrations and application rates, pesticides, herbicides and fungicides can be as much as 100 per cent fatal to fully formed frogs – not just to their tadpoles.

Tests were conducted on common frogs (*Rana temporaria*) using seven different agrochemicals - all of which were found to be damaging or lethal to frogs. How did these chemicals then get onto the market one may rightly ask? The problem is that they were never originally tested on amphibians and are therefore passed as suitable for agricultural use. Currently, only the effects on birds, mammals and aquatic organisms are tested.

Frogs are highly sensitive to environmental toxins of any sort and easily absorb poisons through their skins, but an interesting complication exists, to which there is no satisfactory explanation. When tested using the

[1] Carsten A. Brühl, Thomas Schmidt, Silvia Pieper, Annika Alscher. *Terrestrial pesticide exposure of amphibians: An underestimated cause of global decline?* Scientific Reports 3, Article number: 1135 doi: 10.1038/srep 01135

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same chemicals, the fatality rate within the sample population varies greatly. So far, it seems as if it is the additives used in the products which have a synergistic effect with the active ingredients – but how this works is unclear.

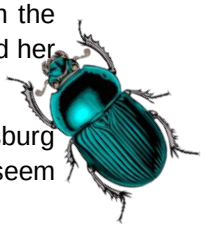
The study was commissioned by the Federal Environment Agency and conducted by the Institute of Environmental Sciences Landau at the University of Koblenz-Landau.

Dung beetles can navigate using the Milky Way

Insects never cease to amaze me. It is all too easy to write them off as small and insignificant or primitive and simple. Nothing is actually further from the truth. If something has been around for as long as they have, perhaps it is well to ask what their secret to success may be? It turns out that insects have a myriad secrets to success – many of which we “higher” life forms are just beginning to recognise.

A study done by Marie Dacke (at Lund University Sweden) is reported in the journal Current Biology and documents how dung beetles use the light from the “bar” of the Milky Way to keep their ball of treasure rolling true. "*The dung beetles are not necessarily rolling with the Milky Way or 90 degrees to it; they can go at any angle to this band of light in the sky. They use it as a reference.*"

Previously, she has been able to show that they were able to keep a straight line by taking cues from the Sun, the Moon, and even the pattern of polarised light formed around these light sources. What intrigued her was their ability to keep a straight path on clear moonless nights.



Dr Dacke is actually a South African, so where better to test the dung beetle skills than in the Johannesburg Planetarium! Here she tested (*Scarabaeus satyrus*) in a controllable environment and found that they seem to navigate by the diffuse light of the entire Milky Way and not by the light of pinprick sized stars in it.

Eland knee clicking

Malcolm Douglas

Anyone who has spent just a little time around wild eland will have heard the characteristic, loud clicking sound the males make from time to time. I have always read with interest the various theories about the why’s and wherefores of this interesting phenomenon but as yet have heard no clear answer to the two most important questions that come to mind viz. why do they do it and how do they do it?

Perhaps the answer is now at least partially established. Scientists from the Zoological Society of London, in conjunction with others from the University of Copenhagen studied the phenomenon in Kenyan eland. (There is little reason to doubt that the same would hold true here in South Africa). What they found was that the clicking sound is made to show off their physical stature, and hence their potential status and mating rights in the population. It is worth considering too, that the eland, being such a large animal would do well to avoid physical fights and confrontations to assess their status. The knee clicking is therefore a way of avoiding the need to physically challenge one another and therefore to avoid unnecessary physical harm.

The researchers found that three main factors were used to demonstrate male status. Hair darkness was used to show aggression, dewlap size indicates age and knee clicking indicates body size. Dr Jakob Bro-Jorgensen (lead author of the paper) believes that the sound is made by slipping a tendon over one of the leg bones, which is how it correlates to body size. He explained that "*the tendon in this case behaves like a string being plucked, and the frequency of the sound from a string correlates negatively with both its length and diameter. Thus, most importantly, depth of the sound is predicted to increase with skeletal measures and it can therefore be directly associated with body size*".

I remain unconvinced about this research for several reasons. If the sole purpose of the tendon clicking is to demonstrate physical size and possible mating prowess, why then do they do it when completely alone? I once watched an eland bull walking all by itself in an open area in De Hoop Nature Reserve. There was no other eland to be seen anywhere, yet he was clacking away as he walked. One thing I do know about animals is that they seldom do things just for the hell of it, so if there was no other eland to hear his signals I doubt he would have done it. Another reason I remain doubtful is that I have noticed that the animal's gait and the slope of the terrain may also have something to do with it. Another time I watched a solitary eland bull as he departed from a waterhole making no sound at all. As the slope got steeper, he put more effort into his stride and the clicking sound immediately started up.

Another more logical query about the research is this. If they don't yet know for sure where the clicking sounds emanate from (and they say this in the paper), then how can they be sure that the size of the tendon is in any way relevant, or is in fact implicated at all? These are not scientific observations, but they are troubling nonetheless. Maybe we have part of the answer, but I don't think the chapter on this issue is closed yet. The research was published in the Journal BMC Biology[2].

What is it?

This tiny frog species is very common in many areas in the country and can even occasionally be found on flooded rugby fields and parks in the midst of our suburbs. They are very vocal, but can be very hard to find.

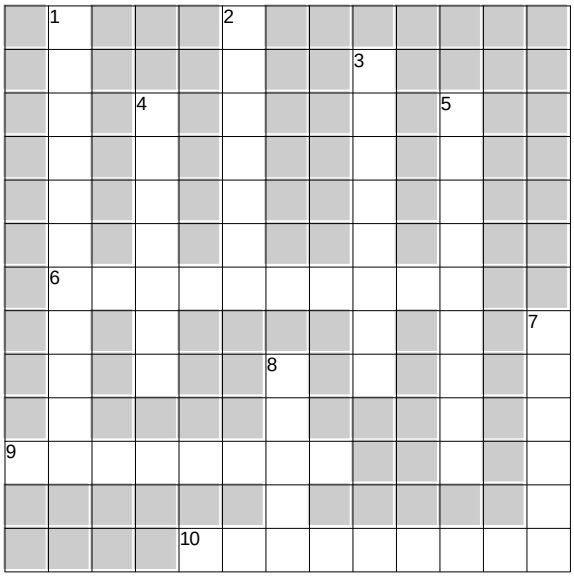
Photos: M. Douglas

A new idea is delicate. It can be killed by a sneer or a yawn;
it can be stabbed to death by a quip and worried to death
by a frown on the right man's brow.

Charlie Brower

[2] Knee-clicks and visual traits indicate fighting ability in eland antelopes: multiple messages and back-up signals Jakob Bro-Jorgensen1* and Torben Dabelsteen2

Crossword



Across

6. Another way of referring to the group to which mongooses belong.

9. An insect order taking its name from the Latin, meaning "same wings"

10. Generic name of one of the Big Five meaning "washboard teeth".

Down

1. The group of primates to which Old World monkeys belong

2. The mechanism of binoculars used to bring left and right eyes into matching focus by adjusting the ....

3. A point on a map or route of travel as recorded on a GPS

4. Butterfly taking its name from a King

5. Milky fluid secreted from the mammary glands for the first day or two after parturition

7. The chitinous "tongue" bearing the teeth of molluscs

8. A better word to use for a "dassie"

Domestic dogs have a “trashy” past

I love dogs, and miss them terribly when I’m not around them. Every day passed without the wriggly, big-hearted happiness that is a dog is a poorer day for it. Thank goodness that some time long ago, wolves came to be dogs. There is no doubt that it happened, but how it happened is still not exactly clear.

There is only one ancestor of all modern dogs – the wolf. Jackals are not in the mix at all. DNA analysis confirms this. In his book “The Greatest Show on Earth”, Richard Dawkins does an excellent job of explaining one current way in which this could have happened. Another has now been put forward and it links nicely to Dawkins’ notion that dogs “evolved” on our rubbish dumps.

The waste heaps of our plant-cultivating ancestors would most likely have contained more waste starches than meaty scraps. I dare say that today the same trend is probably mirrored on our dumps. It therefore stands to reason that an animal capable of utilising starches would have an advantage over the typical wolf which is more specialised to eat a purely meaty diet. That is exactly what domestic dogs show.

A new study of dog genetics lead by Erik Axelsson of Uppsala University reveals that domestic mutts have numerous genes involved in starch metabolism when compared with wolves. Scanning DNA sequences from dogs and wolves, the team identified 36 regions where there were significant differences between the two. The first was in brain development and the second was in starch metabolism – specifically the area coding for enzymes which function in breaking down starches. Dogs *are* much more efficient at breaking down starches than wolves are. How this came to be important, how the first wolf/dog animals came to be in the hands of humans and how we ultimately tamed and domesticated them are all questions that remain open to debate and to scientific scrutiny.

What is it – Answer

The frogs shown are all the common caco (*Cacosternum boettgeri*) - also known as Boettger’s caco or dainty frog and by the Afrikaans name *blikslanertjie*.