Central North Field Naturalists

CNFN the Natural News

Summer 2001 - 02

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Program and Events

January 12 & 13 Mt. Arthur Weekend Arrive at the Mt. Arthur Centre any time after noon on Saturday the 12th. Turn off Lilydale Rd. onto Whites Rd. about 3 kilometres before Lilydale. The Centre is the first drive on the right and is well marked. The large Centre has a fully equipped kitchen, and plenty of room for sleeping inside or pitching a tent. Bring your own bedding and food. A Sunday morning excursion to the top of the mountain will probably leave early. Various other walks can be organised to view the threatened Mt. Arthur crayfish habitat, to look at Lilydale Falls, NE snail habitat, local flora etc. Spend a relaxing weekend with us in this great setting.

February 3, High country walk near the Iris River. Meet at 10:30 a.m. near the "Post Office tree" near Daisy Dell on the Cradle Mountain Link Rd. Peter Sims and John Wilson will be our guides.

March 3, Holwell Gorge walk. Meet at 10 a.m. at the top of Holwell Gorge track. Turn off the Frankford Hwy on to the road to Holwell NW of Frankford. The Gorge car park is NW of Holwell, and should be sign posted.

April 7, Liffy fungi walk Meet at 10 a.m. at the upper Liffy Falls carpark for this great walk.

*** **Memberships are due March 1, 2002. Once again we have held the rates at $15 for individuals, $20 for families and $5 for independent young adults under 18 yrs.**

In Search of the Culprit

by Erika Cox

The diseases of animals in general take second place to diseases of our own species, unless of course their illnesses threaten our food supply. Otherwise it requires an impetus from some other quarter, be it from the tourist industry or environmental concerns to put effort into investigating the illnesses of other species. We can't afford to investigate things from plain curiosity any more.

There are however many instances where diseases overlap, affecting some animal species and us as well, either inadvertently, or sometimes as part of the normal life cycle of the infecting organism. These diseases are technically known as zoonoses, and there are some well known ones such as leptospirosis, rabies and plague.

(And occasionally diseases jump species altogether, sometimes with devastating results, such as happened with the HIV virus, and almost certainly also originally with influenza).

Rickettsial diseases are zoonoses that have been known for some time. The original archetypal richettsial disease is typhus, which is interestingly the only one of the group to be a purely human disease and not actually a zoonosis, although that might not be entirely true either.

This was the disease that is thought to have effected some of our history as much as or perhaps even more

than politicians and armies, deciding the outcome of military campaigns irrespective of the bravery of soldiers or the brilliance of their commanders.

Typhus had a major role in several campaigns in the First World War, particularly in the Balkans and in Russia, and was a major mode of dying among concentration camp inmates in World War II. Anne Frank was one of the named victims.

That typhus should play such a role in human affairs is understandable when we consider its basic biology and life cycle.

Like all rickettsias, *Richettsia prowazekii*, the bacterial organism that causes typhus, leads an obligatory existance inside cells, being a delicate organism not able to survive in the environment. It has a mammalian (us) and arthopod (body louse) life cycle, easily explaining its coexistance with poor living conditions and general misery. Because the solution to the conditions that allow it to be transmitted is so obvious, at least in well off countries, and because it responds well to antibiotics, typhus is not much in evidence in the world today. Only small pockets of infection remain in parts of Africa, Russia and in Peru.

Other rickettsial diseases have not had this intimate association with human affairs as they are truly zoonotic. Human infection is an occasional accident and not at all an essential part of their normal cycle of life. For many of them it is probably not correct to call them diseases as they do not seem to effect their normal mammalian hosts much at all. (The body louse however usually dies of its infection. There is some justice after all.)

Nevertheless they all share the common rickettsial way of life, namely an obligatory intracellular existence, with a life cycle alternating between a mammal and an arthropod vector. In some of these arthropod vectors organisms may be transmitted transovarially, that is transmitted to the next generation of arthropod through the eggs.

There is now a growing number of rickettsial species known to exist. Some occur in only specific parts of the world, while others have a more widespread distribution, sometimes with different mammalian hosts in different parts of the globe. When human infection accidentally occurs they form the Spotted Fever group of diseases, so called because a rash is a common symptom. Probably the best known from the world literature is Rocky Mountain Spotted Fever, caused by *Rickettsia rickettsii*, having as its definitive host wild rodents, and transmission being by their ticks. The good news about all these diseases is that they are treatable with antibiotics if correctly diagnosed.

Australia is also part of the global rickettsial habitat. We have here a unique Australian species, *Rickettsia australis*, the agent of Queensland tick typhus, and we also have rickettsias in common with other parts of the world, such as *Rickettsia typhi*, the agent of murine typhus and Orientia (formally *Rickettsia tsutsugamushi*), the agent of scrub typhus. The mammalian hosts are small marsupials, and the vectors are their ticks or mites.

In the 1970s the general practitioner on Flinders Island, Dr Rob Stewart realised that he was seeing patients with a new disease. Much investigation resulted in 1991 in the identification of a new rickettsial species by Dr Stephen Graves, at that time working at the now defunct Fairfield Infectious Diseases Hospital. Dr John Stenos, at that time working in the USA, named it *Rickettsia honei* in honor of Dr Frank Hone, the Australian discoverer of murine typhus. John has subsequently joined Stephen at the Australian Rickettsial Reference Laboratory after it was established in Geelong in 1995.

Investigations into the biology of *Rickettsia honei* has been an ongoing adventure ever since its first discovery. Genetically it is quite unrelated to *Rickettsia australis*, being more closely related to rickettsias found in S E Asia, and the question immediately arises as to how it got this far south.

Earlier this year an astonishing discovery was made. *Rickettsia honei* was grown from a tick taken from a blue tongue lizard on Flinders Island. This is the first time that a rickettsia has been identified in an ecto parasite of a reptile.

At the same time it is now clear that a human disease having all the clinical features of a rickettsial illness, and often associated with tick bites is occurring on the "mainland" of Tasmania. Is it the same, or is it different from Flinders Island Spotted Fever? Could it be true that its vertebrate host is truly a reptile unlike every other rickettsial species known until now? The hunt is on to identify the organism, to find its definitive host and its vector and to learn more about its place in the grand scheme of the natural world. Much work remains to be done to answer these intriguing questions.

A Crayfishing Tail

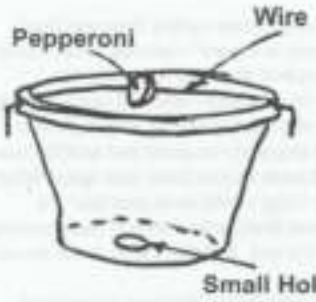
by Jim Nelson

For the past couple of months I have carried out survey work near Scottsdale for the Endangered Scottsdale burrowing crayfish, *Engaeus spinicaudatus*. This crayfish has recently had its status changed from Vulnerable to Endangered because of its very limited distribution. The latest round of NHT grants has very modestly funded some recovery work for the 4 threatened *Engaeus* species occurring in Tasmania and Flinders Island. A preliminary meeting to discuss recovery actions decided that *E. spinicaudatus* should be the priority, and that more survey work was needed to help confirm its distribution.

Like the other 14 known species of *Engaeus* in Tasmania, *E. spinicaudatus* is a cryptic little burrower that is rarely seen on the surface. Therefore, the method of obtaining an animal for identification depends on digging for them. This is not a particularly easy, enjoyable or environmentally friendly way to capture an animal—the process can damage or kill the creature at worst, and at best it destroys its burrow system with unknown consequences. Granted, these active little diggers can have a new burrow in place the next day, but it is quite possible that the old burrow system provided important elements for survival. For instance, it has been noted that plant roots like to penetrate into the burrows presumably seeking higher oxygen levels in areas of very wet soils. These actively growing root tips could represent an important food source for the crayfish as they prune them back to keep their burrows clear. Also, numerous little soil invertebrates may blunder into the burrows providing nice little protein snacks.

Dr Niall Doran provided me with a box of traps several months ago which he had found successful on *E. spinicaudatus*. These were an improvement on a deadfall trap in that they provided a bait to attract the animal along with a simple but irresistible suspension of the bait just out of reach for the crayfish which causes it to drop into the trap. The trap is cheap and simple, using a plastic container, a piece of wire and a bait. The preferred bait according to Niall was pepperoni—a rather exotic crayfish food, but one that suits the trap setter well because it doesn't easily spoil, and it can provide a snack when hungry.

The trap uses a standard take away food container120 mm across by 100 mm deep, with a piece of tie wire put through holes drilled in the rim and bent down at the ends after the bait is threaded on.



A small hole drilled in the bottom of the container allows water in and keeps it from floating. Where there isn't water, the trap can be placed in another container (without the hole) containing water so that water enters the trap and keeps the gilled crayfish alive. A bucket placed over the trap will help keep animals away from the bait and any crayfish in the trap. The top of the trap should be level with the opening of the burrow. The crayfish tries to crawl out on the wire to reach the bait and drops into the trap.

My initial attempts with the trap didn't work, plus Devils would take my bait. Then one full moon night I started catching crayfish, and for the next couple of weeks I had success ranging from 25-100% on given nights. I learned to set traps with discrimination at burrows that showed recent activity, and I seemed to have greater success with buckets over the traps, protecting the bait and the crayfish. The Scottsdale crayfish appears to be quite attracted to pepperoni, providing it is a good night for fishing! I did also catch 3 *E. tayatea* in the traps, but so far it appears that *E. spinicaudatus* is by far the best candidate for trapping.

E. spinicaudatus is fairly easily identified by the spines on its tail fans (see photo). My survey revealed that we are unlikely to find many further extensions to its distribution. It prefers buttongrass areas, and some of its habitat has now been included in the North Scottsdale RFA Forest Reserve.

The air is (scientifically?) alive with the sounds of music

by Ron Negorcka

My first thought when reading Rene van Peer's article ("Singing in thin air"—see last issue) was of Luigi—our resident dog (well known for his affection and intelligence)—who will sing along with my didjeridu playing, but only on long high notes which elicit a singularly mournful and wolflike howl so primeval it sends shivers down your spine! What is going on in Luigi's mind as he does this? I'd suggest it's most likely to be a form of pack-bonding. A social use of sound. And that's what music is—or is it?

In another article titled "Musings of a musical nature", Rene poses the following to differentiate music from animal vocalisations: "[Music]... is an activity aimed at deliberately bringing about a certain effect on an audience that knows of that intention and of the means through which the effect is realised."

While I can agree that this sort of activity—which stipulates a separation between performer and audience—may be uniquely human, surely there is more to music (human or not) than it implies. What about when everyone joins in? Does a baby being sung to by its mother know of the intention and the means? This latter is not a trivial exception. The beginnings of music in humanity may well have begun in just such comforting vocalisations. It's also seems likely that language emerged from the ability of the human tongue to sing.

We live in a situation at Birralee where we are constantly aware of sound interaction in the forest. Luigi too has learnt about this—maybe by instinct or maybe after his observations of Sarah with her binoculars. When the small birds give their warning calls which plainly mean "raptor around" he will look up and scan the sky. If he could talk I'd be asking a few interesting questions!

In a similar way, the birds will tell you of the presence of a snake. There are the times of real distress too when we've heard parent birds vainly attempting to defend their nest against a snake about to devour their young. And it's interesting how "distressed" they sound to us as well as to themselves. There's something about some sounds that definitely cross the species barrier in effect. There are others (like the song of the Dusky Robin—so "plaintive and mournful" to us) where meaning differs according to the species of the listener. One thing for sure is that there is a great deal of intra- and inter- species communication going on around us. And we are inevitably part of it.

Given our evolutionary history it seems inevitable that we assign particular meaning to the sounds of nature. It is not surprising that "Animal voices as such speak with uncommon strength" They "can conjure up images, can suggest a wider environment and atmosphere.." (Rene van Peer—Musings of a Musical Nature) They can also frighten, comfort or amuse. They involve deep emotions. Which brings us back to music—which is something above all which we FEEL. Do birds also express feelings? I am quite sure Luigi does—so why not birds?

Many writers have been convinced that birds sing just because they like to do so. For instance in his wonderful classic "Bird Wonders of Australia (1958), A.H. Chisolm is convinced that "... Birds mimic mainly because they are sound-lovers, and because song is their chief means of expressing their vitality, their high spirits, their joy in life. What right have we to presume that man is the only creature on earth that loves to play with 'sound and sweet airs'?"

What right indeed? But this is not a very satisfying conclusion for the scientist or philosopher who will point out that for all our anthropomorphic tendencies, the fact is that when we find a bird to be "musical", all we mean is that it is familiar to us in a melodic and/or rhythmic sense in a way that reminds us of what we call "music"— i.e. we are caught in a circular discussion with nothing to make us the wiser. The bird almost certainly does not know what we mean by "music". In fact we don't seem to know ourselves. After 30 years of musing on the subject, I have yet to come across a satisfactory definition.

Let's try some different questions then:

Do birds ever sing "just for fun"?

In many species of animal there is a proclivity in the young to "play" as part of the learning process. Playing is indeed a serious matter (not least for the human musician!). There are reports of various birds whose behaviour seems to be purely for the enjoyment of doing it. Galahs for instance have been observed flying again and again into a whirlwind just to get flung out of it.

This is not necessarily an anti-Darwinian notion. Enjoying yourself in the company of others of your kind could be perfectly necessary to survival. It's certainly necessary for human social cohesiveness.

Why do some birds sound so musical to us?

First of all—remember that many of them don't! It's a matter of opinion of course. I think we'd all

agree about the Grey Shrike-thrush or the Bassian thrush. But what about Yellow Wattlebirds or Sulphur-crested Cockatoos? (If you listen carefully though, you will hear hidden within the generally despised raucous shriek of the Sulphur-crested Cockatoo are some glorious trumpet-like timbres.)

Birds use all sorts of sounds to communicate all sorts of things. In fact effective communication depends precisely on creating difference, so the development of such an enormous range of sound by creatures who need it to communicate is hardly surprising.

So is it just some sort of random coincidence that some of it sounds "musical"?

I don't think so—not entirely anyway. And this is where the strong connections between acoustics, the physical nature of sound as a waveform, mathematics and music all come into play.

Pythagoras is credited with the discovery that mathematical laws could be applied to musical harmony. The story goes that he was passing a blacksmith shop and noticed that the hammers sounded very musical together. His stroke of genius was to weigh the hammers—revealing that one was twice the weight of another, two-thirds the size of another, and four-fifths the size of another etc. He concluded that harmony is related directly to the relationships of small numbers to each other.

These days we can show by using graphs of the waveforms how this "just intonation" actually works. There is still conjecture (and some fierce argument) about how it manifests itself in our ears and brains, but for centuries in Europe it was seen as a great mysterious truth, and was the basis for all sorts of conjecture and discussion—like the notion of the "Music of the Spheres".

You can often hear this phenomenon in inanimate nature as well. Tree branches scraping against each other will emit a set of pitches known as the "overtone series" which is another form of this small numbers rule. Windmills and whistling wires are also fascinating examples. Our use of various vowels in speech can be analysed in the same way. Like any other vibrating object, our larynxes (and Luigis') and the syrinxes of birds are going to have a tendency to produce certain sound relationships—particularly "octaves"," fifths" and "thirds". The birds who do this (e.g. Green Rosella, Grey Shrike-thrush, Bassian Thrush) are the ones usually considered the most musical.

What I conjecture is that the nature of sound itself means that there's music in the very ether! There are acoustic phenomena which dictate that we prefer certain sounds and sound combinations for music and effective communication and it is hardly surprising that other animals choose to use them as well.

Is natural sound the voice of Gaia?

For me the sounds of nature provide a source of fascinating sound material , musical inspiration and endless conjecture. There are some however who see deeper things occurring here, like my old friend and colleague David Dunn in Santa Fe. The following are quotes taken from an interview he did with Rene, and begins with a story:

"Even as a child I was very interested in natural history and in the behavior of living things. Growing up in southern California I spent a great deal of time being in the wilderness environment there. That was certainly an innate interest, but part of it had to do with an intuitive fascination for sound as it existed in an outdoor environment. One of the first projects that I actually succeeded in doing when I was 19 years old, was *Nexus 1*."

"I took three trumpet players into the Grand Canyon. My interest was in the reverberations of the canyon itself. The trumpets were set up to be sound activators of that acoustic environment. Over the course of being inside that canyon for three or four days, an event occurred that was quite unexpected—at least on my part. The trumpet players were perched very far apart from each other, playing and hearing these reverberant structures within this immense open space. Three ravens flew over. We hadn't seen any ravens during the previous days. They appeared as soon as the trumpets started playing. They began to fly in front of the trumpet players, doing barrel rolls and all sorts of aerial acrobatics, cawing in and out of the trumpets, and matching pitches with the trumpets. It was very unexpected and very dramatic. It basically set in my mind the question of what was going on here."

His conclusions after years of thinking and working around the subject are as follows.

"These sounds are the evidence of purposeful minded systems of communication. These things have an integrity that is part of a huge fabric of life. While they may be useful in terms of expanding our concepts of musicality and the materials of music, I think there is something more profound that needs to be examined...."

"... The characteristics of those things that we call music as a human activity throughout the trajectory of our species, have been closer [than language] to how other forms of life may communicate. In some sense I believe that music has been a way of conserving just

that way of interacting with our world. When you look at what we call the music of many indigenous peoples in the world, they often exhibit a lot of those characteristics. Certainly it is about social interaction, but it is also about social interaction in an environmental context."

"We swim in this soup of language that is a heritage of our species, and we share that with everything that makes sound. That soup is also in us and we give voice to it. But it's not something that is objective in a simple sense. I think there is no such thing as a fixed meaning. We're always in a process of dialogue that gives rise to meaning. That's a dynamical process. In that sense, when I talk about environmental language, I am really talking about something that has to arise from an interactive circumstance. It's an emergent property. One of the most profound insights of scientific thinking in the later 20th century is this concept of emergent properties. There are these complexities which arise from apparently simple modes of interaction. They transcend the structures of what we would expect to be present by these interactions, and something much more complex arises. Just as life is probably an emergent property, so is language."

There's plenty to explore in these ideas, but the problem really is how you go about doing so. Scientific reductionism is not very useful in the understanding of such "emergent properties". In fact it is likely to reject the idea outright. Australian aboriginal cultures use ritual to put them in touch with the powers of nature, and it's interesting how prevalent is the use of the imitation of animal behaviour in their music and dance, but for us intruders in this Land, this is a world of understanding we are not born into nor have much opportunity to enter.

What indigenous cultures point us to however is "country"—the sacred responsibility of one's locality, around which we develop our own mythology, stories, dance, art and music. Unfortunately this is at the best a slow process, and in the aftermath of Romanticism, Modernism, Post-Modernism and the recent election, it seems to be getting slower in inverse proportion to continued land-clearing and globalisation.

We need scientific understanding—it is fundamental to our future. It is only the arts, however, which express our true sense of place and give us an experience of those things in nature which will always remain mysterious if not downright mystical, but nonetheless real and necessary to us. And maybe—just maybe—we are not the only species for which this is true. (The following was supplied by Ron for further contemplation)

To: oddmusic@yahoogroups.com
Subject: [oddmusic] elephant orchestra

The Thai Elephant Orchestra attempts something different. Its members play sturdier versions of traditional Thai instruments—slit drums, a gong hammered from a sawmill blade, a diddly-bow bass and xylophone-like renats—and a thundersheet and harmonicas. Mr. Sulzer said he and Mr. Lair merely showed the elephants how to make the sounds, cued them to start and stop, and let them play as they wished. After five practice sessions, they started recording. Mr. Sulzer admits he was sceptical at first. "I thought we would just train elephants to hit something, and I would tape that and have to paste it together with other things." Instead, he recorded the performances intact, without overdubbing, in a teak grove, pausing only when outside noises intruded.

The players improvise distinct meters and melodic lines, and vary and repeat them. The results, at once meditative and deliberate, delicate and insistently thrumming, strike some Western listeners as haunting, others as monotonous. Mr. Sulzer wondered whether Prathida, a 7-year- old orchestra member whom he called "the Fritz Kreisler of elephants," would recognize dissonance. "I put one bad note in the middle of her xylophone. She avoided playing that note—until one day she started playing it and wouldn't stop. Had she discovered dissonance, and discovered that she liked it? She outsmarted the researchers."(—from "The New York Times article linked on the elephant orchestra website) http://www.mulatta.org/Thaielephantorch.html

Attention Members of CNFN Inc

The AGM in November installed new executive officers. Micah Visiolo has been elected as our new leader, and Debbie Hill is now in charge of vice. Ron Nagorcka will be minutes secretary. Jim Nelson remains Public Officer and correspondence secretary. Jim is also currently editor of the Natural News by default, and would gladly turn the job over to anyone interested in carrying on this vital link of information, ideas and inspiration.

The Natural News has evolved to reflect the diversity of the membership. All contributions are welcome, whether observations, art, poetry, articles, jokes, puzzles or what have you. We need YOU!

Peregrine (The Wanderer)

by Peter Bamford

Eyes eight times sharper than mine
Chisel the landscape
Mapping long reaches of air.
Meticulously.
Unhurried;
But with intent.

On a sudden lash of wings
The falcon stoops.
(No wanderer now)
One-pointed.
A blur of speed.

The impact
Shocks all pulsing
To a stop.

Soft feather-burst
Sifts earthward.
Randomly.

Such majesty of stoop and speed!
Such mastery of co-ordinate and claw!
An autonomy
To be wished for.
Fiercely.

Book Review

The Last Tasmanian Tiger: The History, Extinction, and Myth of the Thylacine Bob Paddle. Cambridge University Press.

by John Hayward

Paddle's book grew out of a dissertation, a fact too apparent at times in its patches of deconstructive jargon. Its obligatory thesis is that the careless destruction of this species was the result of European contempt for marsupials in comparison with more familiar eutherians.

The thesis finds little in the way of legs, in a general dearth of evidence that Tasmanian settlers thought much about wildlife or had great reverence for fellow placentals. Paddle compensates through what has been described as the most exhaustive trawl through all references to the animal, and a general assault on most accepted wisdom.

My own reason for reading the book was to relieve that nagging curiosity one gets about things I will never see. In this I was disappointed. Nothing from the nineteenth century letters, diaries or journals brought the animal into focus. In the more than 130 years that Europeans shared the island with them there were nothing more than a few fleeting and generally incurious sightings of the thylacine in the wild. Much of the purportedly scientific observations and inferences were wrong, often wildly so.

Paddle has found evidence for a few tantalising suggestions, such as that thylacines may have been cooperative hunters, and that, as pets, were sometimes described as engaging and responsive, but the evidence for anything is almost as meagre as that of the Tasmanian emu, of which almost nothing survives.

One myth that Paddle convincingly puts to rest is that the thylacine was a serious threat to sheep. Records of early pastoral companies, such as Van Diemen's, reveal that the vast bulk of predation was from convicts and feral dogs. The native "tiger" or "hyena" provided a much better explanation for poor returns to distant shareholders. When downturns in the overseas wool market fuelled the human propensity to seek accessible scapegoats and demons, the tiger came in for persecution in inverse proportion to its dwindling numbers. It was in the last quarter of the nineteenth century that graziers formed a league for the extermination of the tiger and eagle in an area where tigers were virtually extinct. They did so while claiming an annual predation rate greater than the district's entire sheep population.

Pressure from disreputable graziers and their agents in parliament led to the imposition of a bounty in 1888. The generous bounty resulted in pathetically few being collected, but it was enough. It was finally removed just before the last known specimen died of incompetence and neglect in the Hobart Zoo in 1936.

What kept me going with this unlovely book after I had given up hope of being able to imagine the living animal was its stunningly accurate preview of the Tasmanian culture we find today. For anyone who has observed the Tasmanian establishment hot on the trail of a white elephant, it is all here: the petty greed, the unfaltering dishonesty, the wastefulness, the perverse stupidity.

The woodchip ram-raid has not yet reached the finality where even our abysmal politicians are compelled to start assessing the disaster. The economic and environmental idiocy of dairy paddock irrigation has not yet appeared on our rates notices for tap water. Paddle's book gives us assurance that these things will come to pass, whatever the puny protests of logic and common sense.

Editor's Note: at around $100, you might want to consider borrowing this book from the library, if you are still interested.

New Bird CD

David Stewart and Ron Nagorcka have combined recordings to bring us the long awaited Tasmanian Bird Calls. If you want to extend your bird lists for bush birds, you have to know their calls.

Available from book stores or from Ron. $25