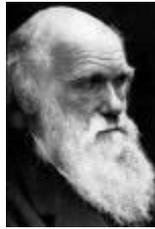


HAPPY BIRTHDAY CHARLES

On Charles Darwin's 200th birthday we look at how species in the Blue Mountains have adapted to harsh conditions and whether they will be able to evolve to prevent them becoming threatened. On his visit to Australia in 1836, Darwin was anxious to see "the interior" and "hired a man and two horses to take me to Bathurst" by way of the Blue Mountains. He was fascinated by Australian animals, particularly the platypus, potaroo and the rat kangaroo but it was often insects which fascinated him most. Ben writes about two, one of which we know Darwin did observe. Fiona looks at the likely changes to our World heritage eucalypt forests, Marc & Jackson research the platypus, Scott assesses the fire threat & Al feels sorry for the local reptiles.



CSIRO scientist Dr. Sands says. Its main food is the blackthorn bush (*Bursaria Spinosa*). The copperwing butterfly is special, in the way that it has an interesting relationship with a specific species of ant (*Anonychomyrma itinerans*). The butterfly will lay its eggs on the blackthorn, these will hatch and a group of ants will come by and eat a sweet substance which the larvae expel. In return they will attend to the larva's enemies.



www.karma.com.au/crc/biodiversity/copperbfly

Threats to the copperwing include; badly timed hazard reduction burns, clearing blackthorn, butterfly collection and invading weeds. The blackthorn which the copperwing feeds on, can only survive at higher altitudes, so climate change may displace these plants and the copperwing butterfly will go with them. Climate change may also displace the ants which tend to the butterfly's larvae. This would be a fatal blow to the copperwing butterfly species, as without the ants their chances of survival drop to zero. Ben

ANT LIONS SUCK

On watching a lion-ant, making a sand hole, in the Blue Mountains, he commented that it "belongs to the same genus, but a different species" to the one he had seen in Europe. We think he was talking about the antlions of the families Myrmeleon and Callistoleon, a type of lacewing found here and all over south eastern Australia. The larva described by Darwin, digs a conical pit at the bottom of which they lie in wait for small insects to fall in.



bugs.bio.usyd.edu.au

They inject saliva into their prey and suck out the juices. Climate change is likely to lead to extinction of thousands of insect species. Ben

12 LEGS BETTER THAN 6

The endangered Copperwing butterfly, which Darwin may have seen on his visit to Lithgow, and now only found between there and Bathurst will be one of the first to disappear. "They're the best indication of climate change"

UNIMPRESSED

Darwin seemed unimpressed by the "extreme uniformity of the vegetation here". He described the mountains as "exceedingly monotonous; each side of the road is bordered by scrubby trees of the never-failing Eucalyptus family.... the foliage is scanty, and of a peculiar pale green tint, without any gloss, hence the woods appear light and shadowless". He was impressed by the size of some of the Blue-gums, which "grow tall and tolerably straight, and stand well apart". The bark of some he remarked "hangs dead in long shreds which swing about with the wind, and give to the woods a desolate and untidy appearance". Professor Hughes of Macquarie University says "We would expect to see over the next few decades some changes in the structure and the composition of plant communities in general in mountain areas like



the Blue Mountains, and that will include changes in eucalypts". Some species will thrive, some may become extinct. It is clear that the forests as we know them today will change. It's difficult to predict what will happen, but the composition of communities will be different in the future to that we see now. Fiona

DARWIN TO LITHGOW

On descending Victoria Pass Darwin "entered upon a country where the vegetation improved; the trees were both finer and stood farther apart". Staying in Wallerawang, he was told that it had been "a few years since this country abounded with wild animals; the emu is banished to a long distance, and the kangaroo is become scarce; to both the English greyhound has been highly destructive. It may not be long before these animals are altogether exterminated". We're not sure how many feral greyhounds are still out there. We know they're



fast but kangaroos?? We'd rather see a greyhound in a jumper than a jumper in a greyhound. Get it? Nevertheless, Darwin was certainly aware of

the "survival of the fittest" effect of introduced species. The cat today is wreaking havoc on the birds & small mammal populations. Chris

THE HEAT IS ON FOR SKINKS

Climate change may make it harder for local cold blooded animals like the endangered Blue Mountains skink to keep cool in the future. In studies on another Australian



reptile, the heath monitor, Dr. Kearney, of the University of Melbourne found that when "air temperatures are higher, the availability of habitat in which to shade is also altered". In addition, deforestation will also reduce the shade available. He says "the big surprise of their work was to find that cold-blooded animals were more focused on keeping cool than on warming up, changing the timing of activities (feeding and reproduction), with flow-on effects to "whole ecosystems". Alastair

FIRES - WORSE TO COME?

Bushfires were clearly in evidence as Darwin "scarcely saw a place without the marks of a fire". Will we see more bushfires in the future? The recent Victorian



tragedy is ominous. by the Australian Bureau of Meteorology and the CSIRO has found that bushfire seasons will start earlier, end slightly later and become more intense in coming decades. By 2020, days of extreme fire danger are forecast to increase by up to 65 %. We know our plants are adapted to fire but can they survive hotter, frequent infernos? Scott

IS THE PLATYPUS STUFFED?

It certainly was in Darwin's day together with most fauna they came across. "In the dusk of the evening I took a stroll along a chain of ponds, which in this dry country represented the course of a river (Coxs)..... Sometimes there are high and impetuous floods, and had the good fortune to see several of the famous Ornithorhynchus paradoxus" (platypus epa photo) which his host, Mr. Browne, promptly shot. The platypus, though not common, is still seen in the Southern Blue Mountains along the



Wollondilly, Nattai, Kowmung, Kedumba, Coxs, upper Nepean & Abercrombie rivers. usually in pools of slow-moving water.

The NSW state of environment report found "although this species is secretive and under-recorded during systematic surveys, it appears secure in the reserves of the Blue Mts. Jackson

USE OUR BRAINS

Finally, Dr. Raupach, of the Global Carbon Project - "we face such rapid shifts from climate change that unguided evolution cannot keep up. Our only option is to use our brains, to guide us out of foreseen climate and ecological danger zones, before we blunder into them. We live on a finite planet-our future depends on living within its means."