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Keeping Guides on Target

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## Nest building skills are learned according to a new study

How weaver birds develop the considerable skills required to build their nests has always been hotly debated. Some scientists say that the skill is innate or instinctive, while others say that it is learned.

According to a recent study lead by Dr Patrick Walsh of Edinburgh University, the skills are learned. The team studied southern masked weavers in Botswana.

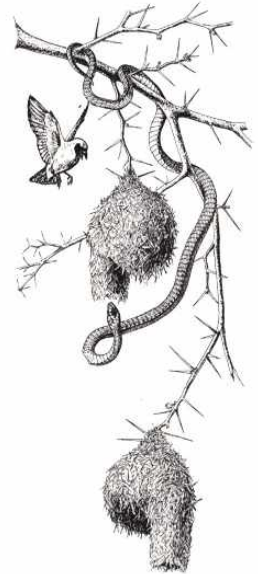
They found that experience played a major role in perfecting the techniques used, with some birds varying their methods from one nest to another. Some began from right to left and others from left to right. As they developed their skills, they dropped fewer blades of grass, made better knots and became faster at building.

This does not necessarily show that they learned

everything about nest building, but it does make a strong case against the genetic “blueprint” model. If they were genetically programmed to build nests, then one would expect that all nests would be built using very similar if not identical methods.

*“Southern masked weaver birds displayed strong variations in their approach, revealing a clear role for experience”.*

The research has been published in the Behavioural Processes journal.



## Bat echolocation made by “superfast” muscles

Superfast muscles have been found in fishes, birds and reptiles, but until now never in mammals. Scientists have recently discovered that these muscles (which twitch up to 100 times faster than regular muscles) are responsible for creating the high frequency calls that bats emit.

Ecolocation is the method that microbats use to find their prey. The high pitched sounds echo off surrounding objects and bounce back to the bat which then analyses whether they are returning from fixed terrain, prey, other bats etc. Once a bat locks onto an airborne prey item, it homes in using its “radar” and as it gets nearer, finishes off with a “terminal buzz” of up to

190 calls per second.

Researchers from the University of Southern Denmark led by Prof Coen Elemans, designed tests to investigate just how fast the terminal buzz could be. They discovered that the maximum frequency of the buzz was not limited by the echo return time, but was controlled by the muscles in a bat's throat which contract once per call emission. The study was conducted on Daubenton's bat, but it is probable that all echolocating bats use the same fast-twitch muscle fibres in this way.

The research was published in the journal Science.



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## “Sacrificial Limbs” on trees

I recently came across a [Christian newsletter](#) (Issue 4 Nov / Dec 2009) on the internet explaining the miracle of the “sacrificial limbs” of fever trees. It stated, “*Where other trees may struggle to grow, even in slightly saline conditions, the fever tree thrives! This is due to an amazing adaptation known as the ‘sacrificial limb’. What the tree does, is dump undesirable nutrients and salts absorbed through the extensive root system, into just one of its branches, which it sacrifices - the branch eventually withers, dies then falls off - preventing the rest of the tree from being poisoned and dying off completely. And some argue that all this just happened by some incredible chance.*”

Around five years ago I started hearing of a new hypothesis which stated that fever trees (*Acacia xanthophloea*) have a clever mechanism for redirecting excess toxins and nutrients into their lower branches, which are then subsequently “sacrificed”, thereby trapping the toxins where they can be of no further harm. The idea sounded feasible to me, but not being an expert on plant physiology I could not verify this myself.



The source of the idea never became clear, but it went from strength to strength until it has now become a “fact” in the field guides’ repertoire. This despite the fact that there is not a single authoritative reference to it anywhere in the literature. This mythical ability has apparently now spread to include the leadwood tree!

Sadly, the rumour has gained sufficient momentum to be published as fact in books (*Game Ranger in your Backpack* for example). The information is also being wrongly taught in field guide training schools around the country. Like all things, there is much more to the story than is at first apparent - again highlighting the danger of quoting and repeating stories bandied about by amateurs and the unqualified.

By the same method (but unbeknownst to them), impalas mysteriously developed the ability to delay their lambing! It took just forty years or so to dispel that rumour - I hope this one doesn’t take as long. As guides we owe it to ourselves and our guests to verify that the information we are giving out is true or not.

I decided to research this subject and found nothing on Google Scholar, PloS, Wiley Online Library, JSTOR or any other repository of scientific peer-reviewed research to support it. I then queried the subject with local tree doyen Professor Braam Van Wyk who stated in a letter to me “*The popular story told by field guides about the shedding of branches in fever trees is, as you suspected, a rumour not based on facts.*”

There are however, some interesting facts and phenomena that probably gave rise to this story. I have tried to outline these as simply as possible.

- The process of shedding branches in trees is called cladoptosis which is a natural part of plant senescence - the way in which plants age and shed leaves and stems.
- Branches that are shaded by the growing canopy of a tree eventually become inefficient and their benefit falls short of the cost to maintain them. At this point the tree shuts off the water and nutrient supply to the branch and it dies in situ. In most species, these “aborted” branches quickly fall from the trunk, but in others such as the leadwood they may remain attached for a very long time.
- Since fever tree branches are covered in green living bark, dead branches stand out in stark contrast to the rest of the tree, being a dark black colour. This gives the impression that it harbours something very different to the rest of the tree. When the branches of other trees die they look little different to the rest of the tree since their branches are already covered in dead bark.
- Although some *Acacia* species do have a method of shunting nutrients around to get rid of redundant branches and change the ratio of roots to shoots, this carbon partitioning has nothing to do with the matter of sacrificial limbs.

In the words of Professor Van Wyk, “*Guides should focus on the facts and the many other intriguing questions when it comes to tree behaviour, rather than resort to nice-sounding stories that are essentially nonsense...*”.

"The most beautiful thing we can experience is the mysterious. It is the source of all true art and all science. He to whom this emotion is a stranger, who can no longer pause to wonder and stand rapt in awe, is as good as dead: his eyes are closed."

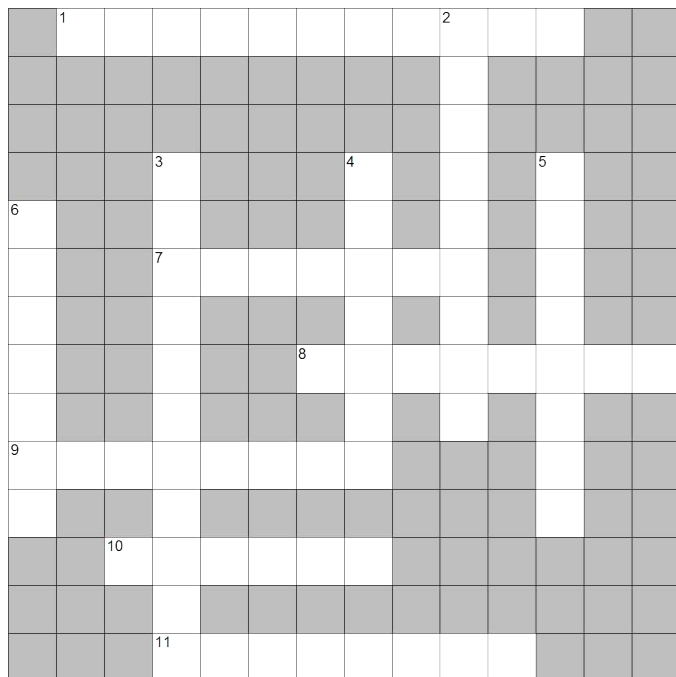
Albert Einstein

### What is it?

These "nuts" are often found in elephant dung in the lowveld reserves. What plant do they come from? They are shown here about life sized.



### Crossword



EclipseCrossword.com

#### Across

1. Eject the contents of the stomach through the mouth. (11)

- 7. Periodic shedding of the cuticle in arthropods. (7)
- 8. The general region between the anus and the genital organs. (8)
- 9. Expulsion of gases from the stomach of ruminants. (8)
- 10. A natural opening or perforation through a bone. (6)
- 11. The branch of zoology that studies the behaviour of animals in their natural habitats. (8)

#### Down

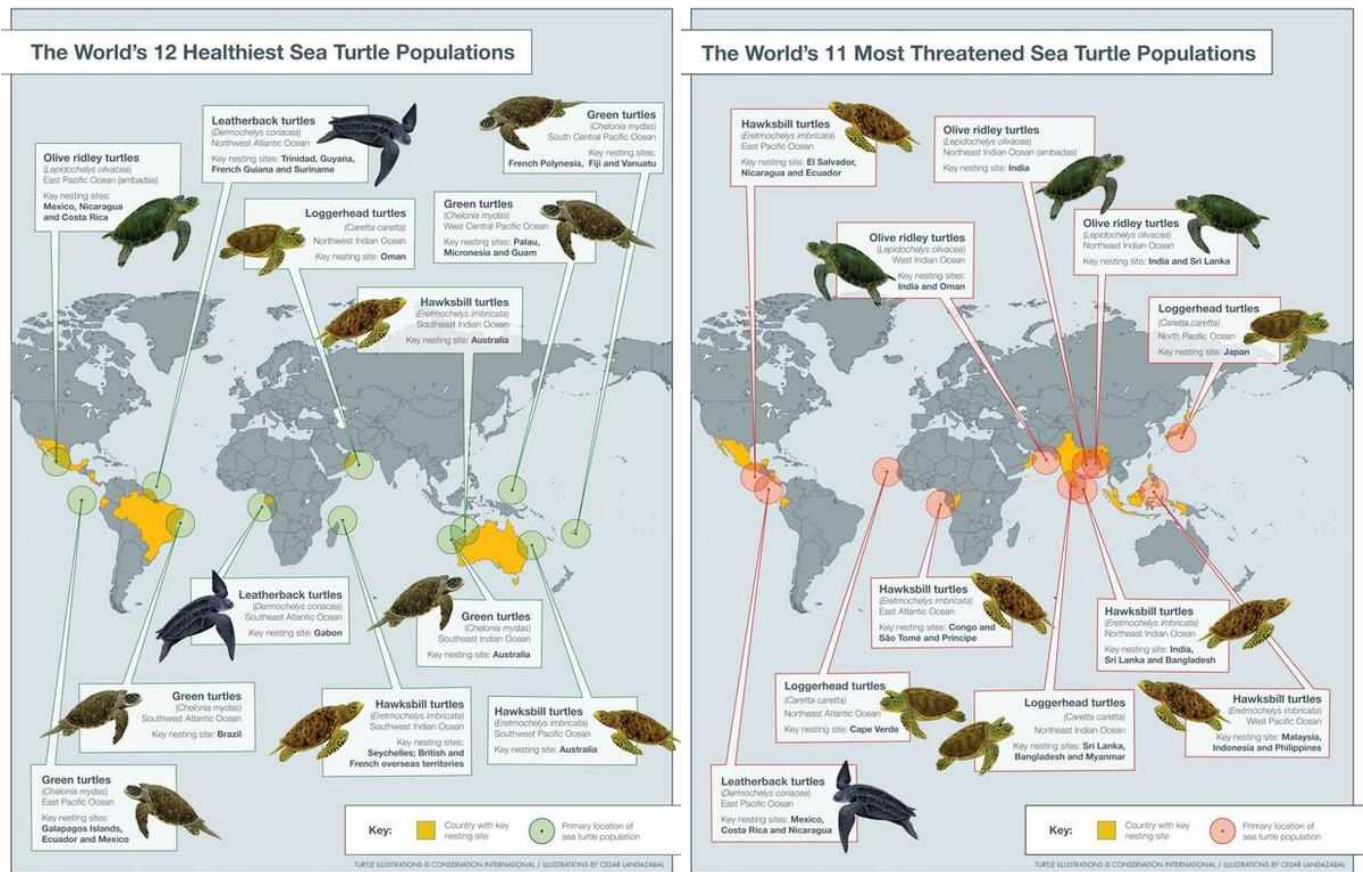
- 2. Behaviour that relates specifically to fighting. (9)
- 3. A thin but distinct layer in a large body of water in which temperature changes more rapidly with depth than it does in the layers above or below. (11)
- 4. The part of a zebra's leg located between the fetlock and the hoof. (7)
- 5. Loss of hair (especially on the head) or loss of wool or feathers. (8)
- 6. The nutritive and protective gelatinous substance surrounding the yolk of an egg. (7)

### Current status of world sea turtle populations

A recent report, compiled by IUCN (International Union for Conservation of Nature) Marine Turtle Specialist Group (MTSG) has listed the world's most endangered and healthiest populations. The most obvious finding is that the worst area globally for turtle conservation is in the northern Indian ocean region. 45 per cent of

threatened turtle populations worldwide are found there.

The top causes of the global pressures on turtles are fisheries bycatch and direct harvest of turtle eggs and adult turtles for their shells and meat.



[IUCN Marine Turtle Specialist Group](http://www.iucn.org/eng/species/sea_turtles/species_group.asp?group=1)

## What is it - Answer

The seeds shown belong to the torchwood or greenhorn tree (*Balanites maughamii*). The trees are very statuesque, having solitary upright trunks with deeply fluted buttresses. The name greenhorn comes from the green coloured spines which are found on the zigzag-shaped branchlets and which form an asymmetrical “Y” shape. The branches which bear the fruits are usually spineless or have far fewer spines than the rest of the tree.

The fruits are oily and rather unpleasant smelling but are relished by elephants and kudu. The vegetation around the base of fruiting trees is usually flattened by the activities of animals searching for the fallen fruits. Elephants often push with their foreheads against the tree’s trunk to dislodge them.

When the nut is cracked open it reveals a seed which may be lit and burned like a torch (photo right) - hence the other common name - torchwood.



The American reading his Sunday paper in a state of lazy collapse is perhaps the most perfect symbol of the triumph of quantity over quality.... Whole forests are being ground into pulp daily to minister to our triviality.

Irving Babbitt