



Observations of an Owl (5)

Cat-astrophy

Let's warm up with a thought experiment. Go on, just for a minute – try assuming my role. Imagine you are an... owl.

Got it? Fine, then let's take this scenario a little further. Imagine a cold and dark winter's night. You are hungry. So off you fly to a certain group of pine trees at the border of your wood, you settle on a

branch and start carefully watching the huge open meadow below. It is your favourite hunting place. You've caught yummy morsels of mice, moles, shrews, even gophers and squirrels every time you've been here.

Still with me? Okay. You wait and watch ... watch and wait ... and suddenly the world in front of you explodes. Within a split second, from the land of suburbia beyond the far end of the meadow, rockets, shells and other flaming projectiles are illuminating the sky with bright and vivid colours. FIREWORKS!! Hundreds of crackers explode with deafening bangs and booms and numerous other pyrotechnical gimmicks are howling, wailing, yelling and screaming around your head...

End of the experiment. Thanks for your participation!

Well, now you know how I felt a couple of weeks ago because that's exactly what happened to me. I had completely forgotten about New Year's Eve and suddenly found myself in the centre of a pyrotechnical crossfire. You can imagine my shock and horror. I lost at least two-dozen feathers, couldn't sleep a wink the entire next day and my appetite was effectively blown away for two nights.

When my brain finally cleared and I was able to think straight again, I soon realised that another year – at least in human terms – must have just gone by. In order to calm myself down further, I started trying to recall what I could from events in life sciences over the last year...

These days, quite a number of science journals and magazines provide collections of annual highlights. Of course, I also studied some of them once I had completely recovered from my New Year's Eve firework frenzy. It's always interesting to compare one's personal view.

I found no surprises, more or less just the issues that had received the most prominent press coverage: Like the "Hwang stem cell fraud"; the discovery of the 375-million-year-old fossil of fishy-froggy Tiktaalik as a missing link showing how water-living creatures once conquered the continents; a couple of studies showing speciation and evolution "in action"; new genome sequencing techniques; powerful new developments in light microscopy; to mention but a few...

Interestingly, when I started thinking about my "Life Science Review, 2006" a completely different story immediately materialised in my mind, one that had never made the top headlines. And although this single case might not have been terribly important, I somehow felt that it was representative of a larger issue which itself continues to increase in importance.

"Sometimes DNA information can be deceptive – particularly if you try to make statements about ecology or evolution."

The story centred around the 2006 *Science* paper "The late Miocene radiation of modern felidae: A genetic assessment" (Vol. 311:73-7). The authors had analysed and compared every piece of cat DNA they had been able to find, put them in their computers, ran some sophisticated software and finally presented a comprehensive scenario of cat evolution – complete with migrations of cats out of Asia into the New World and back, along with the emergence of ocelots, bobcats, lions and all the other major felid groups. Strangely enough, the inclusion of well-known fossil evidence in their paper was exceedingly low. On the other hand, that was no wonder since they had no cat fossil expert in the team. All their far-reaching conclusions were entirely based on what their algorithms extracted from the cat sequences.

In my opinion, this paper demonstrates the immense growth of confidence in computational biology over the last couple of years. Don't get me wrong; in general this is alright and well deserved. Undoubtedly, computational biologists have achieved great success in analysing the vast datasets from the numerous "-ome"-projects. Moreover, they have proven what a rich store of information genomes bear and how to effectively mine those treasure troves. However, sometimes that information can be deceptive – particularly if you try to cross borders and make statements about ecology or evolution based on DNA analyses alone, whilst displaying a complete disregard for long-accumulated knowledge and expertise in these fields.

Soon after publication, the authors of the cat evolution paper had to admit that they had been most atrociously deceived by their DNA data. One of their conclusions in the paper states that cats did not arrive in North America any earlier than 8 million years ago. Palaeontologists did not know whether to laugh or cry when they read that claim, since fossils of true North American cats as old as 17 million years had already been discovered quite some time earlier.

Embarrassing, isn't it? And yet so easy to avoid! One or two phone calls would have sufficed. Obviously the gap between modern computer-based biology and classical biodisciplines like ecology, morphology and evolution is becoming wider and wider. They seem to communicate less and less with one another – even in cases where a mutual benefit clearly lies at hand.

By the way, the *Science* editors didn't exactly play a glorious role in the cat story either. Apparently, they also regarded a thorough integration of fossil data into the author's conclusions as negligibly important. They are also to blame. And deservedly so!

Well, now that I've told you yet another story, I'd like to leave you with a personal remark. Never in my wildest dreams did I ever anticipate bestowing cats with even a hint of prominence in this column. I positively detest the feline cretins; some of my dearest friends have ended up as gourmet snacks on their palates. But, if these ugly furball-belching monsters serve science, well ...

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