Observations of an Owl (7)

Spongy Egos

There is one thing we owls and you humans have in common: We are both rather vain creatures. Yes, yes, admit it, we both take ourselves for the crowning glory of creat-... oops, sorry ... heh ... how the heck could that happen ... hrrrm, I mean ... the crowning glory of *evolution*, of course. Yes, *E-V-O-L-U-T-I-O-N*. Forget the "c-word"; I never even mentioned it. (Phew!)

So, why exactly do we think we are the crowning glories of evolution? After all, there are a lot of very sophisticated things we are incapable of doing – but at which others are adept. We cannot breathe under water, we cannot live from light and gas alone, we haven't a hope of growing to be a hundred metres high, ... Nevertheless, we both revel in these anthropocentric and "strigiformo"-centric images of ourselves. Why is that?

I am pretty sure the main reason is our extraordinary brain; we are convinced that we are the most advanced thinkers on our planet. Why, we are so good at thinking that we can even think about ourselves... solve sudokus ... and, of course, do science.

Okay, I'm on the verge of delving into the muddy waters of psychology and philosophy. So, let's take another turn and instead discuss which views and expectations concerning our biology we have developed from these overindulgent images of ourselves, and, more significantly, how more recent results in biological research have been a terrible disappointment.

Take first of all our brains. Big thinkers need big brains – or so we've all thought to-date. Okay, it's a fact that you humans definitely have the highest brain mass-to-body mass ratio of all animals, followed by dolphins, us birds and some other mammals. But what about that recent report in *Lancet*? French neurologists presented a 44-year-old man, a married father of two children and working as a civil servant, who only had about 10 per cent of the usual brain mass (No please, spare me the bad jokes about the intellectual demands of the civil service at this point). A massive enlargement of ventricles had replaced most of the man's brain tissue leaving only a very thin cortical mantle. Nevertheless, he was leading an almost normal life, despite having a much lower brain mass-to-body mass ratio than a stupid toad.

Well, nobody has found an owl with such a mini-brain, so far. However, one general lesson to be learned from this man is that there is no reason to be proud of brains just because they are big (in relation to body mass). This certainly applies to us, too.

This conveniently brings me to another point where sheer numbers apparently don't matter at all; the genome. For decades it has been common knowledge that the genomes of some plants, amphibia and even of unicellular amoeba contain many more kilobases than your's and our's. Only recently, the genome of the Arctic-dwelling shrimp-like amphipod, *Ampelisca macrocephala*, was reported to be a whopping 63.2 billion base pairs. That's 20 times larger than the human genome and 60 times larger than that of my detestable avian fellow, the chicken. And we're only talking about plankton...

Okay, let's relax! It's certainly not size but quality that matters. So, what represents the quality or complexity of a genome? The genes, of course! Surely it was easy then to assume that the more complex a being, the more genes it must have, as you (and also we, I reluctantly admit) had hitherto thought.

Wrong! We are both aware of the disappointing facts that have more recently been streaming in from the big genome sequencing and annotating factories. It's a fact now that birds and humans only have ever-so-slightly more protein-coding genes than worms, flies and even unpretentious anemones. Whereas, the genome of the Black Cottonwood, *Populus trichocarpa*, carries twice as many.

With this in mind, it ought to follow that our superior complexity is based on the quality of our genes. That's how we both came to adjust our notions. Logically, unique beings like us, must have a great portion of unique genes and gene products that nobody else possesses – least of all any primitive and boring things such as anemones or sponges.

> ***"At the genomic level owls and humans are more like anemones than they are like flies or worms"***

Some curious fellows checked this out (and I cannot say that I am happy about their ego-blasting results even if it boils down to the simple truth). They found that the vast majority of our genes are also present in sponges and anemones. Sponges for example, despite having no nervous system of their own, still carry the genetic components for synapses. Of course, their products perform a different job in sponges but whichever way you look at it, our synaptic proteins and their genes are far from being unique. They are not original inventions of our more recent direct ancestors, after all.

If that's not enough, the results from the anemone genome are even more disturbing. The comparison of gene families has finally led to the conclusion that, at the genomic level, humans and birds are more like anemones than they are like flies or worms. Ugh! Anemones, humans and (begrudgingly) we too, I suppose, still have plenty of genes in common, which the lineages of worms and flies have already deleted during their evolution. Seen from this perspective, our genomes are paradoxically more primitive than those of worms and flies.

According to the study, 80 per cent of our vertebrate genes are ancient in origin, appearing before the origin of the Metazoa. "We are the products of fundamental genetic structures that were almost entirely pioneered by our single-celled precursors," as one of your colleagues commented, "We are bacteria writ large and sloppy."

It is now obvious from all these insights that incredible potential is hidden in the complex interaction within genetic networks. So, it looks like the last hope for both our vain egos is to finally emerge as the "best networkers".

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