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## Blog 8 – Creativity – the Biology of Learning – walking upright

It has been a while since I last wrote. There has been a lot going on and I have been observing how I learn within all of that.

I mentioned in my previous post about the Stone Age nature of part of our brain and that, despite, newer additions, these prehistoric relics appear to influence everything. Whether we like it or not, that ancient brain is subconsciously scanning everything and anything in our path. It decides whether or not something can be eaten, or will eat me, is a possible mating opportunity and/or is assessing our environment for things we recognise (1, p112). Ultimately it aims to keep us safe, fed and reproductive.

The newer aspect of our brain, the neocortex, developed whilst our predecessors were on the move, seeking out new land, food and the associated predator/prey problems of each. It is likely that *Homo sapiens* males walked up to 12 miles a day everyday (women half that) and those that survived were those who had developed cognitive skills to problem solve and collaborate (1, p20). In early man, this ability to assess, recall and think quickly on his feet against a predator that could be larger, stronger and swifter, was the difference between life and death.

Modern man is still in the same mode, primitive and neocortex areas of the brain scanning all that comes his way (4); is it good, is it bad, is it useful, have I seen that before? The brain is making decisions all day based on its recall of what has gone before. It is also beginning to problem solve to address possible next steps to avoid or deal with the issue at hand (5).

My aversion to carrots is well known amongst family and friends; I avoid them at all costs because I know what effect they can have on my digestive system. The pleasure of eating carrot cake is far outweighed by the consequential pain of a gut that is just irritated by them. Avoiding carrots is easy when I am cooking for myself – I have found that sweet potato is a good alternative.

However, the problem comes when I am eating out. Carrot is everywhere, not just as a nice bright Vitamin A addition to your plate, but as a staple ingredient in stock and many soups, sauces and baby food. It even creeps in, disguised as carotene, in some ready meals and liquid medication. Add to that, the puzzled response of most restaurateurs, as carrot is not on any allergies and intolerances list, and you can see that a few challenges have to be surmounted before I get to eat dinner. I tend to either phone ahead or just order steak and chips!

This scanning and associated cognitive activity makes a brain greedy in terms of calories required to run its circuitry. Spontaneous neural activity utilizes the majority of the brain's energy budget (2). For an organ that constitutes just 2% of the body's mass, it demands 25% of its energy supply; around 500 kcals. Early man's brain was small, limited by what was mainly a fresh fruit and veg diet. It isn't possible to maintain a modern human brain and body on foods that are eaten raw without having to eat throughout the day. You just cannot physically eat the necessary calories unless you eat continually for 9 hours every day. However, our modern bigger brain developed when man moved on 2 legs instead of 4 and discovered how to cook. 1.5 million years ago we left our primate relations and branched out into Gordon Ramsey territory; cooking predigests raw ingredients and means we can eat more calories in less time and walking upright uses less calories than moving on all fours (1, p9). At the same time there was an associated increase in our brain size as cognitive skills appeared alongside evidence of culture and language development (3)

Having to think on your feet is tiring, but, if our prehistoric ancestors are anything to go by, it is what our brains are actually designed to do. Honed in the furnace of an ever changing environment, our

brain flourishes when its host is physically active, is moving and meeting the novel and the interesting (1, p4). So, I'm not really that bothered about the carrot problem. The real issue is whether to have rump, sirloin or fillet.....

#### References

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(3) Herculano- Houzel, S. (2013) *What's special about the human brain* TED Talk  
<https://www.youtube.com/watch?v=7XH1CBzGw&list=PLwMbgYJDZaFQMMgHOjf4opHNpdbcYaoRQ&index=6>

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[https://www.ted.com/talks/mehdi\\_ordikhani\\_seyedlar\\_what\\_happens\\_in\\_your\\_brain\\_when\\_you\\_pay\\_attention](https://www.ted.com/talks/mehdi_ordikhani_seyedlar_what_happens_in_your_brain_when_you_pay_attention)

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