

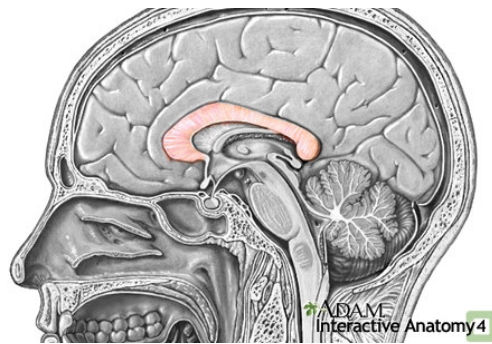
White Matter Motorways

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Isn't it great to think that you are in direct possession of the most sophisticated piece of machinery on the planet. One which even the most highly trained scientists admit they are still only just beginning to understand.

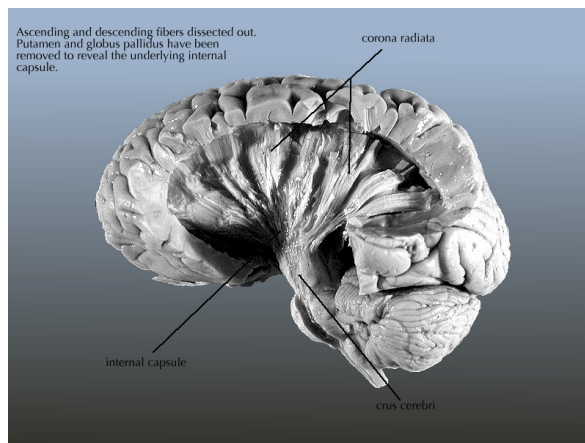
I am sure you are anatomically aware of the main lobes of the brain, the cerebellum, the brain stem, a couple of glands and the long extension that we call the spinal cord. Having had opportunities to examine amazing dissections, I have been captivated by an incredible group of structures that really contribute to this thing's sophistication: the miles and miles of cells, the motorways within the brain, that interlink various regions and the rest of the body. I thought I would offer you a view of these white matter motorways, which we are often taught simply to equate with the idea of the myelin sheath!

Let's start from a structure that I'm sure you are aware of: the corpus callosum. Can you describe it? Where would you say it runs? I suspect you are familiar with the image on the right. Yes, it connects the two sides, or hemispheres, of the brain and if you held a brain in your hands it would be visible on gently parting the two lobes at the midline and looking down between them. It would look, not like the rest of the outer brain mass that has curvy bumps and wiggly dips (sulci and gyri being the latin plurals for these terms respectively), but more ribbed, like a thin corderoy with the lines running from left to right.



The beautiful bit that you miss from this viewpoint (and these illustrations) is just how far each of these 'lines' run into both hemispheres. Don't forget, that each one is made up of hundreds of thousands of nerve cells or neurons. For the most part, each neuron connects with a similar place in the opposite hemisphere and those origin and end points reach to within a short distance of the outermost part of the brain. Note also how far forward, down and round, and then back the corpus callosum actually stretches, and how thick it is. If you could take away the rest of the brain matter around it you would end up with a stunning and HUGE fan like structure, a thick winged, curvy butterfly!

But it is not the only one of the relays that are so important. Another exquisite-when- exposed white matter motorway, that helps link the cortex to the brainstem and spinal cord, is called the corona radiata. Its dictionary definition is: *the radiating crown of projection fibres passing from the internal capsule to every part of the cerebral cortex*. So, if you return to imagining you have a brain in your hands, the internal capsule is

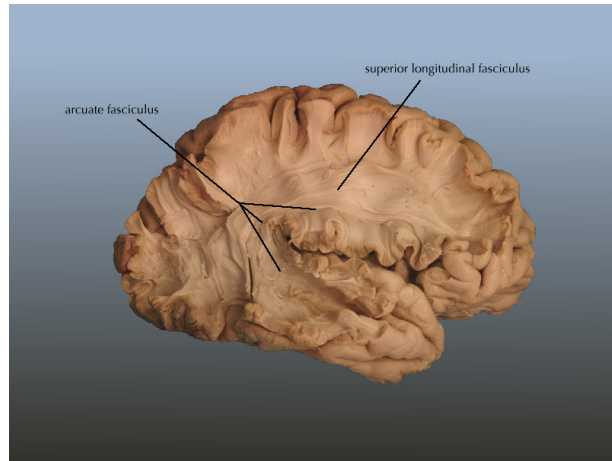


deep within it, a fan shaped area on both sides of the brain just above and on top of the brainstem (the outer, bulbous parts of the midbrain, called the crus cerebri are continuous with this area). From here the corona radiata projects to every part of the cerebral cortex, again, to just below the surface of all the gyri and sulci, coming forwards, upwards, sideways and backwards. Viewed in isolation (as in pic 2) you can see just how extensively the communication pathways allow transfer of information to and from the cortex and cerebellum and spinal cord (via the brainstem).

Two other 'motorways' that can be visible on skilled dissection of the brain are the superior and inferior (upper and lower) longitudinal fibres that connect the front to the back, and temporal sides to the back, of the brain. They run within each hemisphere and have the wonderful names of superior and inferior longitudinal fasciculi (meaning 'bundles' of nerve fibres).

Why are these relevant? Without these relays and nerve bundles sharing the information in the ways that they do – high speed, direct, interlinking pathways – the brain's ability to perform so many tasks concurrently with seeming effortless would not be so great. Reaching out for an object, let alone moving, manipulating or carrying out a skilled task would be impossible. Having a conscious response to the world, understanding what we are seeing or hearing... I could go on and on.

Relevant to Bowen? Undoubtedly. I have not studied Bowen, but always feel during the treatments I have had that something is definitely going in my brain - whatever that something is will certainly be using many of these routes. Having an awareness of their existence is, perhaps, a small step to gaining a new understanding this complex piece of kit, but for me, these images also inspire a moment or two of awe.



Images 1. From Adam Interactive, Instructors edition 2. & 3. from www.neuroanatomy.ca, a fantastic site detailing the Anatomy of the Brain from the University of British Columbia.