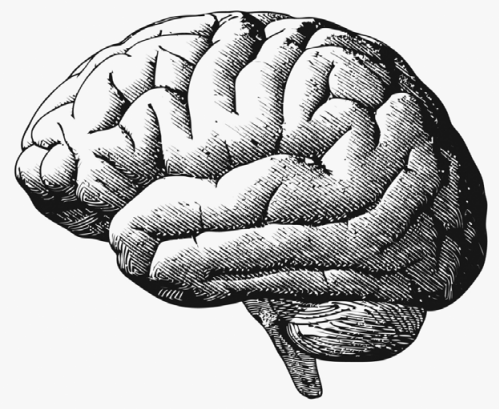
Tekst 9

The brain’s method of spring cleaning

By neuroscientist Dean Burnett



1 Pretty much everything we do, everything we are, is based on the connections between cells, the synapses, that form in our brain. Indeed, for a long time scientists believed that the adult brain was essentially ‘fixed’, and couldn’t be changed in any significant way.

2 […]

3 Phagocytosis is a process whereby cells will envelop and consume smaller cells or molecules, in order to remove them from the system. It’s basically cells eating other cells, or substances. Our immune system is based on this; dedicated white blood cells consume pathogens, thus getting rid of them and their disruptive influence on our bodies.

4 A lot of phagocytosis is happening in the brain, at any given time. While keeping pathogens and other invaders out is obviously very important, phagocytosis is happening just to keep the brain running as is, i.e., maintaining homeostasis. It’s important to remember that the brain is an incredibly busy and demanding organ. Estimates suggest it uses up about a third of the body’s ready energy supply, **37-1**. This means that the brain is something of a cellular powerhouse; there are countless complex processes happening between and within our brain cells, all the time.

5 The thing is, all these processes will have unusable byproducts. The brain’s workings create a lot of debris. And this debris has to be got rid of, because otherwise it builds up and disrupts things, **37-2**. A lot of this clearing away of cellular detritus happens when we sleep (that’s one theory as to why we sleep at all), and processes involving phagocytosis are how it’s cleared.

6 But it’s not just everyday housekeeping. A lot of the time, the connections in the brain need to be removed. When we hit adolescence, a process called ‘pruning’ is initiated, **37-3**, and the resources they were hogging unhelpfully are redirected to more useful things, making the brain more efficient and ready for adult life. And all this happens because the brain is, in a very real sense, eating itself. But in ways that make it better, not worse.

7 Our brains aren’t static. They’re flexible, adaptable, constantly reacting to what life throws at them. That’s largely the source of their power. But they wouldn’t be able to do this if they weren’t willing to eat parts of themselves on a regular basis.

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De zinnen die samen alinea 2 vormen, staan hieronder maar niet in de juiste volgorde.

1p **36** Wat is de juiste volgorde?
Noteer de letters voor de zinnen in de juiste volgorde op het antwoordblad.

a Even so, the idea of our brains actively consuming themselves, essentially eating different parts, is a strange one.
b Modern evidence means this assumption is no longer so dominant, and the adult brain is acknowledged as being more flexible, more changeable, than was originally assumed.
c Nonetheless, that's exactly what's happening, all the time.

2p **37** Geef aan voor **37-1**, **37-2** en **37-3** in alinea 4, 5 en 6 welke zin daar is weggelaten.
Noteer de letter van de zin achter elk nummer op het antwoordblad.
Let op: er blijven vier zinnen over.

Kies uit:

a analogous to the explosive force of a steam engine
b by digesting solid particles and transforming them
c growing in size and increasing its interconnectivity by accumulating knowledge and storing memories over time
d just like how no litter collection for months would make residential streets very hard to get around
e merely by staying alive and doing what it needs to do
f thus disabling the imaginative faculties of the human hard drive
g whereby all the unused neurological connections we accumulate during childhood are eliminated