Opening extract from

BIG QUESTIONS from little people ... answered by some very big people

Written by

Gemma Elwin Harris

Published by

Faber and Faber

HOW ARE DREAMS MADE?

Alain de Botton

philosopher

Most of the time, you feel in charge of your own mind. You want to play with some Lego? Your brain is there to make it happen. You fancy reading a book? You can put the letters together and watch characters emerge in your imagination.

But at night, strange stuff happens. While you're in bed, your mind puts on the weirdest, most amazing and sometimes scariest shows.

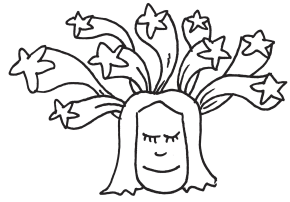
You might be swimming the Amazon River, hanging on to the wing of a plane, sitting down for a five-hour exam with your worst teacher or eating a pile of worms. Things that you know from real life, and perhaps haven't even paid much attention to, have a habit of cropping up in dreams in full Technicolor: the man who runs the newsagent suddenly has a starring role in a holiday you're dreaming of having taken in Zanzibar. A boy at school you never speak to turns out to be your best friend in a dream.

In the olden days, people believed that our dreams were full of clues about the future. Nowadays, we tend to think that

dreams are a way for the mind to rearrange and tidy itself up after the activities of the day.

Why are dreams sometimes scary? During the day, things may happen that frighten us, but we are so busy we don't have time to think properly about them. At night, while we are sleeping safely, we can give those fears a run around. Or maybe something you did during the day was lovely but you were in a hurry and didn't give it time. It may pop up in a dream. In dreams, you go back over things you missed, repair what got damaged, make up stories about what you'd love, and explore the fears you normally put to the back of your mind.

Dreams are both more exciting and more frightening than daily life. They're a sign that our brains are marvellous machines – and that they have powers we don't often give them credit for, when we're just using them to do our homework or play a computer game. Dreams show us that we're not quite the bosses of our own selves.



WHY CAN'T I TICKLE MYSELF?

David Eagleman

neuroscientist

It's puzzling, isn't it? No matter where you try to tickle yourself, even on the soles of your feet or under your arms, you just can't.

To understand why, you need to know more about how your brain works. One of its main tasks is to try to make good guesses about what's going to happen next. While you're busy getting on with your life, walking downstairs or eating your breakfast, parts of your brain are always trying to predict the future.

Remember when you first learned how to ride a bicycle? At first, it took a lot of concentration to keep the handlebars steady and push the pedals. But after a while, cycling became easy. Now you're not aware of the movements you make to keep the bike going. From experience, your brain knows exactly what to expect so your body rides the bike automatically. Your brain is predicting all the movements you need to make.

You only have to think consciously about cycling if something

changes – like if there's a strong wind or you get a flat tyre. When something unexpected happens like this, your brain is forced to change its predictions about what will happen next. If it does its job well, you'll adjust to the strong wind, leaning your body so you don't fall.

Why is it so important for our brains to predict what will happen next? It helps us make fewer mistakes and can even save our lives.

For example, when a chief fireman sees a fire, he immediately makes decisions about how best to position his men. His past experiences help him foresee what might happen and choose the best plan for fighting the blaze. His brain can instantly predict how different plans would work out, and he can rule out any bad or dangerous plans without putting his men at risk in real life.

So how does all this answer your question about tickling?

Because your brain is always predicting your own actions, and how your body will feel as a result, you cannot tickle yourself. Other people can tickle you because they can surprise you. You can't predict what their tickling actions will be.

And this knowledge leads to an interesting truth: if you build a machine that allows you to move a feather, but the feather moves only after a delay of a second, then you *can* tickle yourself. The results of your own actions will now surprise you.

WHY DO WE COOK FOOD?

Heston Blumenthal

chef

Of course, we don't have to cook food. Before people discovered fire, probably about 1.5 to two million years ago, they ate berries and nuts and other stuff that didn't need cooking, just like wild animals do. And they ate lumps of raw meat and fish, which probably wasn't that nice – very chewy and not very tasty.

The strange thing is, even after fire was discovered, we think that it was a long time – I'm talking many thousands of years here – before anyone realised that they could use it to cook! They built fires mainly to scare away wild animals. Some scientists think that one day, someone must have dropped a bit of raw meat or fish in the fire. After a while they noticed how good it smelled, tasted it and realised the heat had made it much more enjoyable to eat. Cooking was born, and eventually everybody was doing it because it has three very important effects on our food.

First, it makes a lot of raw, hard foods softer and easier to eat. Take a potato, for example. It starts off as a solid lump but

cooking can turn it into soft, fluffy mashed potato. Second, it makes our food safer to eat. Sometimes food contains microbes that could make us ill. However, most of these microbes don't like really hot temperatures. Cooking them kills them, so they can't make us sick.

Third – and this is the most exciting effect for a chef like me – cooking can change food into something that looks, smells and tastes wonderful. Heat changes what it touches. Think of wood or coal in a fire turning to ash. Think of a candle gradually melting away. Heat not only makes the texture of food better, it breaks down ingredients into particles that are full of flavour, and it makes those ingredients react together to create new flavours. It can turn a pink, squidgy sausage into something browned, juicy and delicious. And it can turn a pale blob of dough into a lovely loaf of bread, which can even be cooked *again* to turn it into that crunchy, tasty piece of toast with your breakfast.

I've been cooking since I was a kid and to me it's still a kind of magic. It's amazing to watch it happen – and even more amazing to eat the results.