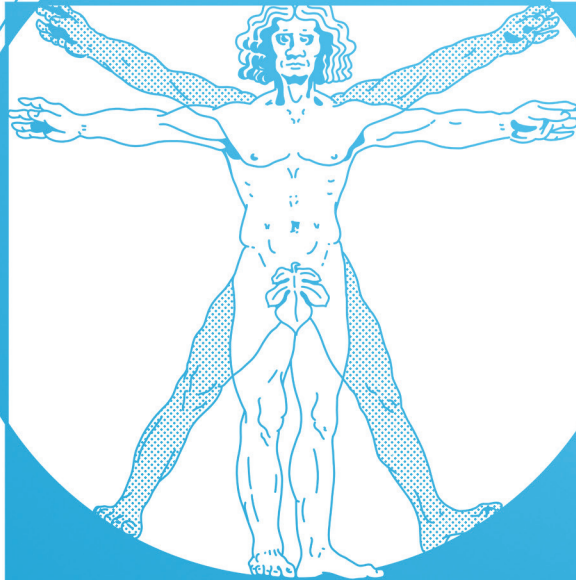
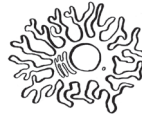


JOURNEY THROUGH THE BODY



A VISUAL EXPLORATION
DR EOIN KELLEHER



INTRODUCTION

There is a world inside all of us that keeps itself hidden. While we may sometimes feel that we stumble or falter in our daily lives, our bodies are gracefully working with consistency and purpose. Behind the scenes, there are a whole variety of systems and processes to help us meet the challenges of the outside world.

When we stop and think about it, most of these systems do not require us to stop and think. We instinctively know, for instance, which way is up and which is down, even with our eyes closed. I would wager that if you put down this book momentarily and found a tiger facing you, you would not have to think to tell your heart to beat faster or your pupils to dilate. These things just happen automatically.

Our bodies are actually remarkably well designed for the world we inhabit. Our immune system is a stunning, complex creation that has evolved to protect us from the array of threats in the environment. Our bodies are adept at extracting large amounts of nutrients from the food we eat and converting them into the building blocks essential for life, even as the bones and muscles that scaffold us provide a robust and versatile means to navigate our world.

But the human figure also represents something more to us than the mere mechanics of survival. For millennia, humans have experimented

with different ways of representing or depicting it. The human form is used to represent a myriad of deities. Parts of the body have been used to symbolise emotions, such as the heart for love, or the brain for intelligence. The subject of the human body has been a favourite of artists for many centuries, and this fascination has helped remarkably improve our knowledge of human anatomy.

With the following illustrations, I hope to shed light on some of the more interesting aspects of the body, from the intricacies of the immune system to our ability to interpret and adapt to the world around us. Artists or art movements have inspired many of these illustrations, but some are just idle creations of my imagination. I have not set out to write a comprehensive tome of physiology and anatomy, but merely to give you a novel glimpse into the inner workings of the ultimate work of art: the human body.



NERVOUS SYSTEM

THE BRAIN

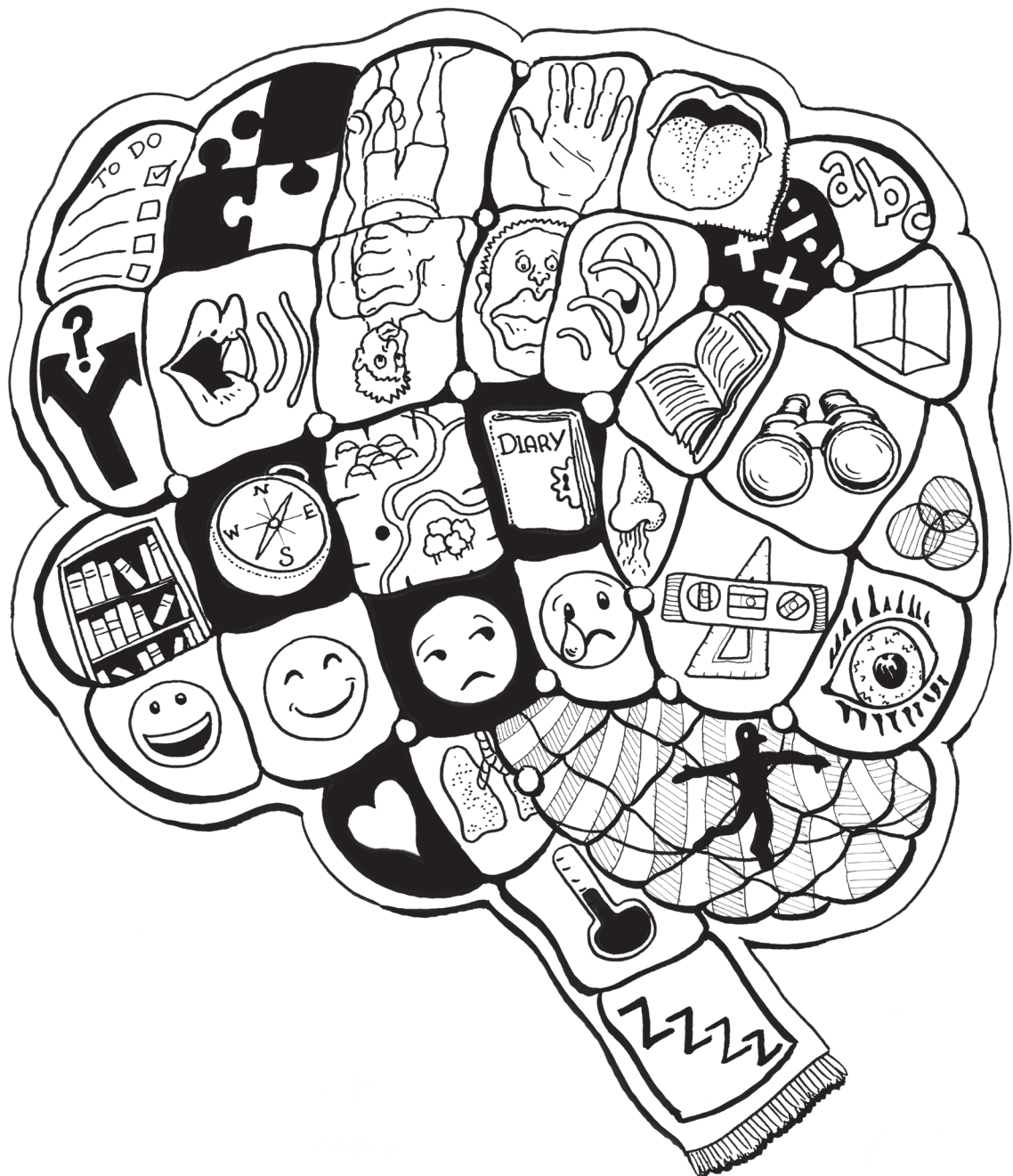
One of the greatest achievements of neuroscience over the past few decades has been identifying which areas of the brain are responsible for different functions.

The cerebrum is the largest and most developed portion of the brain. It can be divided anatomically into four lobes: frontal, parietal, temporal and occipital. Each lobe contains distinct areas responsible for different functions. The frontal lobe contains centres for speech, motor control and decision-making. The parietal lobe has the centres for sensation. The temporal lobe has the areas responsible for hearing,

memory formation and spatial awareness. Visual perception is contained within the occipital lobe at the back of the brain.

Beneath the cerebrum lies the cerebellum, which is responsible for coordination and balance. Finally, connecting the rest of the brain to the spinal cord is the brainstem, the most primitive part of the organ. The brainstem is responsible for essential functions such as the control of breathing, regulating our heart rate and blood pressure, temperature control, sleep and other vital bodily functions.

The brain makes up about two per cent of a human's body weight and the cerebrum makes up eighty-five per cent of the brain's weight. However, overall brain size does not correlate with level of intelligence. For instance, the brain of a sperm whale is more than five times heavier than the human brain, but humans are still considered to be of higher intelligence.





DEEP CORTICAL STRUCTURES

Life on Earth is thought to have begun deep in the ocean near hydrothermal vents, and today some of the most bizarre living creatures reside in the deep sea. Similarly, while most of our conscious activity happens at the surface of the brain, in the cerebral cortex, a lot more is happening deep within the brain.

These areas are known as the deep cortical structures and include the cingulate

cortex, amygdala, mammillary bodies, hypothalamus and thalamus. They are responsible for many tasks. For example, they act as a relay centre, managing the signals being sent out and received by the brain. They also coordinate the movements and signals being sent out to the rest of the body.

Santiago Ramón y Cajal was a Spanish pathologist and the father of modern neuroscience, who received the Nobel Prize in Medicine in 1906. He was the first to discover that the brain is made up of many individual nerve cells. In the course of his work he produced many detailed drawings of nerve cells that are now regarded as works of art in their own right.





AUTONOMIC NERVOUS SYSTEM

Many of the behind-the-scenes functions of the body are carried out by the autonomic nervous system, which is controlled by nerves in the brainstem and spinal cord. This system is made up of the sympathetic nervous system and the parasympathetic nervous system, i.e. the 'fight or flight' and 'rest and digest' systems.

The sympathetic nervous system can be stimulated by anything that might threaten survival. For example, if you were to put down this book and see a snake in front of you, your 'fight or flight' response would spring into action. Your pupils would dilate to improve your eyesight; you would breathe

faster; your heart would beat more quickly; your mouth would go dry; you would go into a cold sweat; your hairs would stand up on your body; and blood would be diverted away from the gut towards muscles, thereby preparing you to fight or run.

When the parasympathetic nervous system is activated, so is our 'rest and digest' response. So if you happen to be sitting down with this book, you will be suitably relaxed for this response to kick in. Your pupils will constrict to focus on the text, your heart and breathing will slow down, and blood will be diverted to the gut to allow food to be digested and absorbed.

Roy Lichtenstein was an American artist known for being a leading figure in the Pop Art movement of the mid-twentieth century. By using industrial techniques to depict daily images taken from advertisements and comic strips, his work provoked a debate on the distinction between mass culture and fine art.





BODY CLOCKS

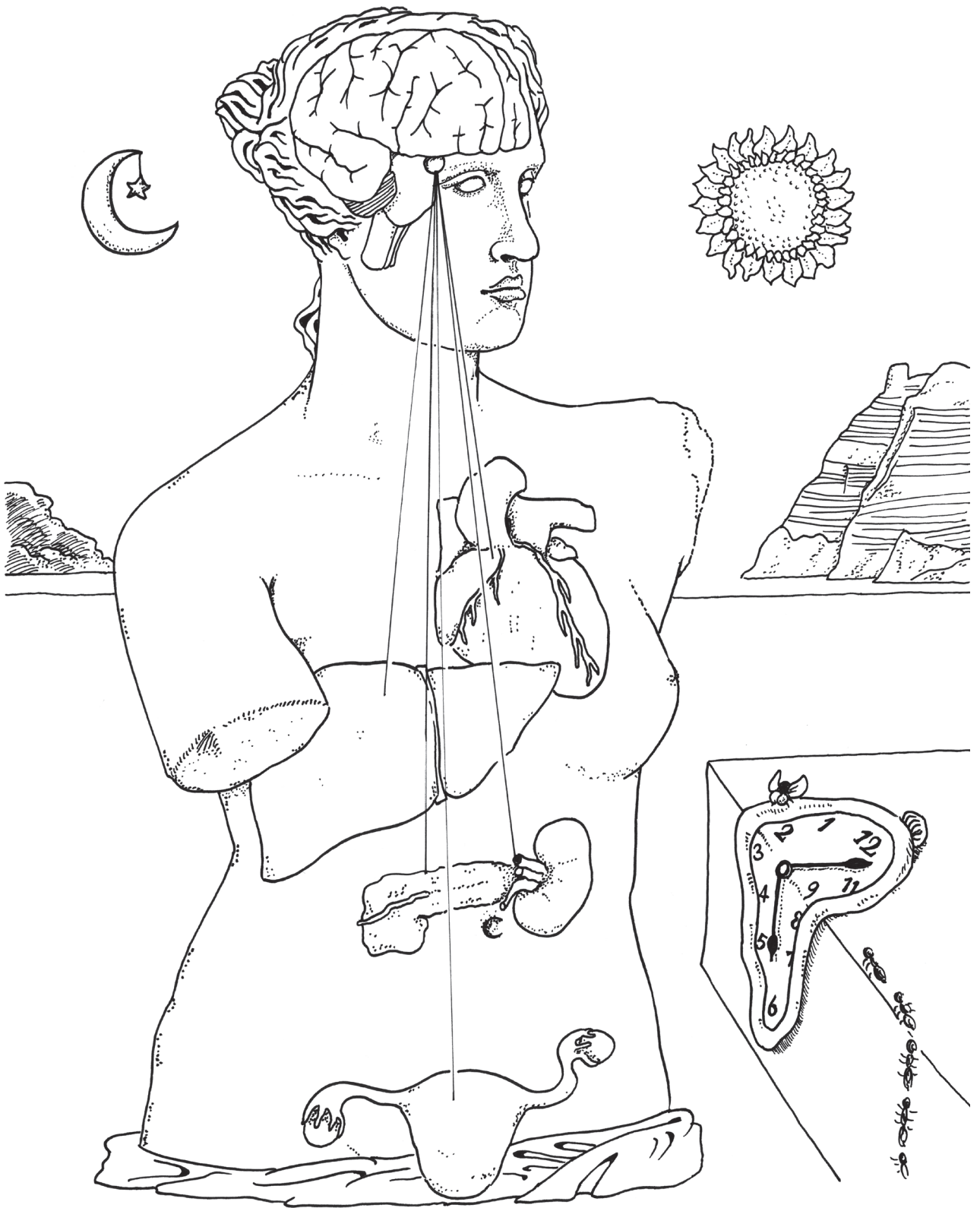
Circadian rhythms are physical, mental and behavioural changes that follow a daily cycle. (*Circa* is the Latin for 'around', *diem* for 'day'.) They respond primarily to light and darkness in the environment. Sleeping at night and being awake during the day is an example of a light-related circadian rhythm. Circadian rhythms are found in most living organisms, from animals and plants to tiny microbes.

In humans, our circadian rhythm is controlled by the master clock in a part of the brain called the suprachiasmatic nucleus,

located in the hypothalamus, on the underside of the brain. However, almost every organ in the body contains its own independent clock as well.

The circadian rhythm is also influenced by outside factors, particularly daylight, as well as other factors known as *zeitgebers* (literally 'time giver' in German). Examples of these include mealtimes and room temperature. However, even if all these factors are removed, the human body is still subject to its own internal daily rhythm and there is nothing we can do to avoid it.

Surrealism was an art and literature movement that arose in Paris in the early twentieth century, with leading figures such as Salvador Dalí, René Magritte and Max Ernst. The Surrealists sought to liberate the mind from the constraint of rational thoughts and reason that dominated the Age of Enlightenment. The movement was influenced by the work of Sigmund Freud and placed a heavy focus on dreams and psychoanalysis.



HAVE YOU EVER WONDERED WHAT YOUR BODY IS REALLY LIKE ON THE INSIDE?

Have you ever asked yourself how it all works? Perhaps you have read about it, but found that words were not enough. Thankfully, a picture is worth a thousand words.

Journey Through The Body: A Visual Exploration is a captivating book that brings the body to life for young and old alike. Going beyond realistic depictions of human anatomy, it brings the reader on an immersive trip around the body's organs, with imaginative illustrations that are not just enjoyable but also explain how the body works. These illustrations reimagine the human body, drawing inspiration from a wide variety of artistic styles, from Pop Art to Surrealism, in a fresh and enticing manner.

