VINTAGE

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About the Author

Carolyn Steel is a leading thinker on food and cities. Her first book, *Hungry City*, received international acclaim, establishing her as an influential voice in a wide variety of fields across academia, industry and the arts. It won the Royal Society of Literature Jerwood Award for Non-Fiction and was chosen as a BBC Food Programme book of the year. A London-based architect, academic and writer, Carolyn has lectured at the University of Cambridge, London Metropolitan University, Wageningen University and the London School of Economics and is in international demand as a speaker. Her 2009 TED talk has received more than one million views.

BY THE SAME AUTHOR

Hungry City

In loving memory of my mother and father, who always fed me well

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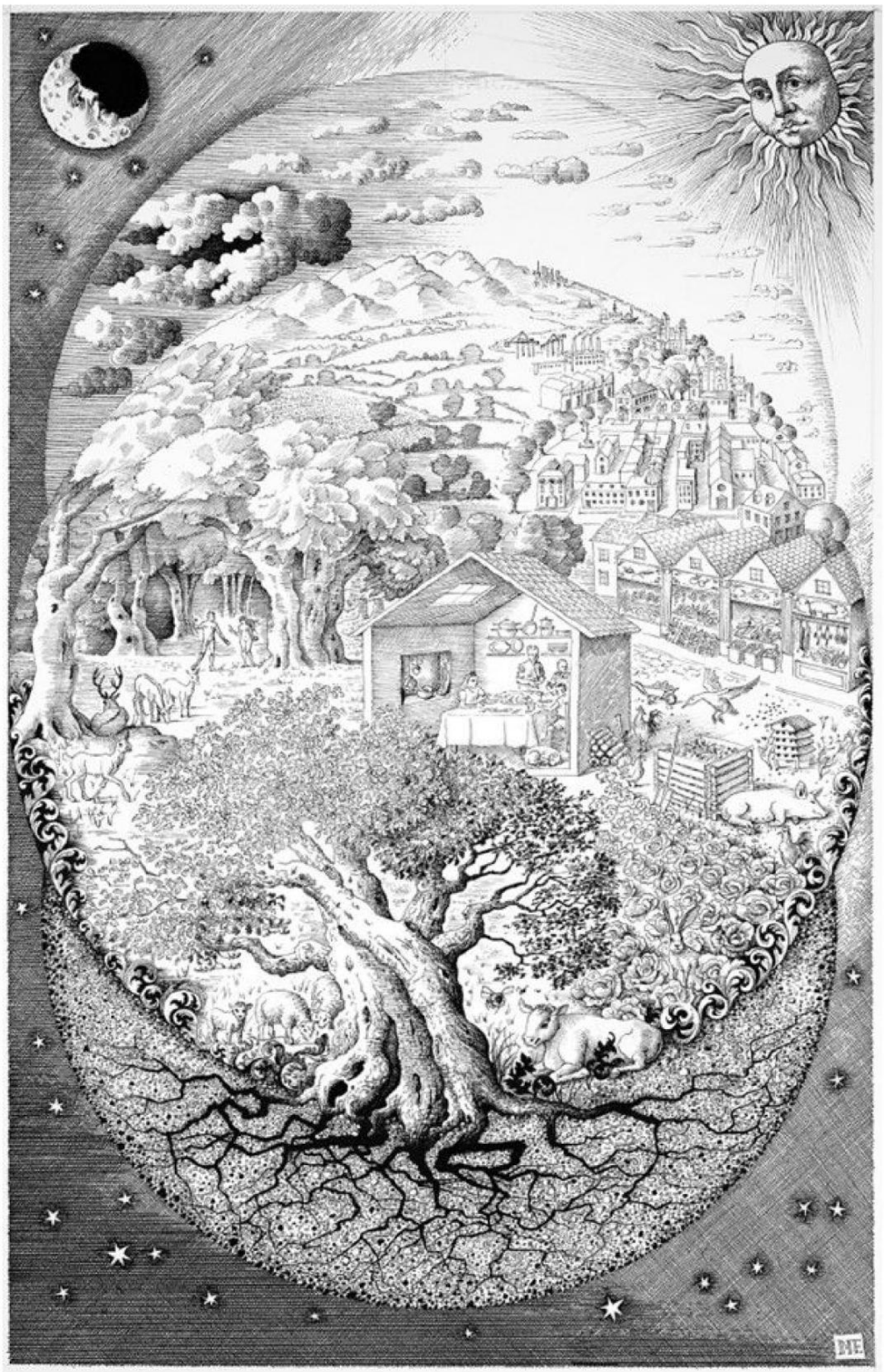


Introduction

Several years ago, I attended a TEDGlobal conference in Edinburgh. On the last day, after nearly a week spent listening to dozens of thinkers, inventors, artists and activists all talking about their inspiring lives and work, I was slumped exhausted on a beanbag when a tall Dutchman approached me and introduced himself as a senior director of Shell. 'I'm looking for answers,' he said. 'I've been here all week listening to people and have heard nothing important. We have vast problems to solve here! Have you got any good ideas? If you can give me one, I have millions to invest!'

After several days absorbing what had felt to me like a non-stop stream of good ideas, I was somewhat taken aback. Nevertheless, I reflected on what the man from Shell had said and eventually told him that what I thought we most lacked in the world was philosophy. 'We've forgotten how to ask the big questions,' I said, 'such as what makes a good life.' I'll never forget the look on his face. It went from incomprehension and incredulity to impatience and, finally, anger. '*We don't have time for that!*' he almost spat at me. 'We are seven billion people, living beyond our means, destroying the planet, and you say that *what we need is philosophy*?'

Although not the immediate inspiration for this book, this exchange did help to galvanise my reasons for writing it. As the highly stressed Dutchman pointed out, we twenty-first-century humans find ourselves facing multiple life-threatening challenges; ones that require big thinking, urgent action and global cooperation if we are to sort them out. On that, the oilman and I were heartily agreed; where we differed was in our approach to tackling the crisis. Whereas he sought technical solutions to our various problems, I wanted to address their underlying causes by examining the factors, assumptions and choices that had created them. While technology and philosophy are hardly mutually exclusive disciplines – clearly we need both – what our grumpy exchange on the beanbags demonstrated was the gulf that can exist between the two. It is this divide that I seek to bridge in this book through the medium of food.

Why food? Because it is by far the most powerful medium available to us for thinking and acting together to change the world for the better. Food has shaped our bodies, habits, societies and environments since long before our ancestors were human. Its effects are so widespread and profound that most of us can't even see them, yet it is as familiar to us as our own face. Food is the great connector, the stuff of life and its readiest metaphor. It is this capacity to span worlds and ideas that gives food its unparalleled power. It is, you might say, the most potent tool for transforming our lives that we never knew we had.

In my first book *Hungry City*, I explored how the feeding of cities has shaped civilisations over time. The book followed food's journey from land and sea via road and rail to market, kitchen, table and waste dump, showing how each stage of the journey had shaped people's lives around the world. By the end of writing the book, I had come to realise quite how profoundly food shapes virtually every aspect of our existence. I decided to call the last chapter 'Sitopia' (from the Greek *sitos*, food + *topos*, place), in order to name the phenomenon that I'd discovered:

the fact that we live in a world shaped by food. In some ways, food's influence is obvious (when we're hungry, for example, or when we can't do up our trousers), yet in other ways its effects are deep and mysterious. How many of us stop to wonder, for example, about food's influence over our minds, values, laws, economies, homes, cities and landscapes – even our attitudes towards life and death?

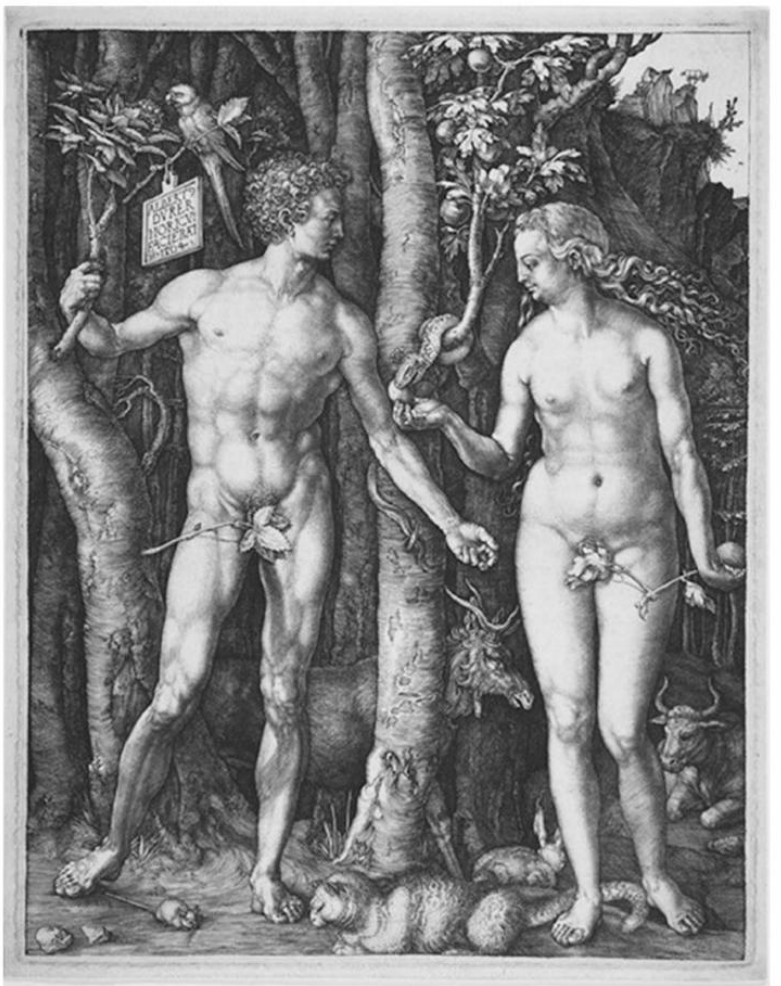
This book follows on from that earlier discovery. Food shapes our lives, yet since its influence is too big to see, most of us are unaware of the fact. We no longer value food in the industrialised world, paying as little for it as possible. As a result, we live in a bad sitopia, in which food's effects are largely malign. Many of our greatest challenges – climate change, mass extinction, deforestation, soil erosion, water depletion, declining fish stocks, pollution, antibiotic resistance and diet-related disease – stem from our failure to value food. Yet, as this book will argue, by valuing food once again, we can use it as a positive force, not only to address such threats and reverse numerous ills, but to build fairer, more resilient societies and lead happier, healthier lives.

Like *Hungry City, Sitopia* is arranged in seven chapters representing a food-based journey, in this case starting with a plate of food and travelling out to the universe. The story begins with food itself, moving out to the body, the home, society, city and country, nature and time. At each stage – or scale – of this journey I use food as a lens to explore the origins and dilemmas of our current situation and to ask how we can improve it.

Food lies at the heart of sitopia, yet this book is not primarily about food; rather it explores how food can help us to address our many quandaries in a connected and positive way. We can't live in utopia, but by thinking and acting through food – by joining forces to build a better sitopia – we can come surprisingly close.

1

Food



Google Burger

> Technology is the answer. But what was the question?
>
> Cedric Price[1]

In August 2013, an audience gathered in London to witness a remarkable gastronomic event. Broadcast live from a TV studio and hosted by ITN news anchor Nina Hossain, it involved the cooking and tasting of the world's first lab-grown beefburger. Crackling with tension, the occasion had the incongruous air of a Saturday-morning cookery show hijacked by some secretive research facility. Instead of the usual celebrity guests and breezy chat, there was the burger's creator, Maastricht University Professor of Physiology Mark Post, perched uneasily on a stool, next to two anxious-looking 'guinea pigs' – Austrian nutritionist Hanni Rützler and US food writer Josh Schonwald – ready to try what might be the food of the future.

Revealed from beneath a silver cloche, the burger looked innocent enough, although on closer inspection its purplish hue and too-smooth texture (plus the fact that it sat in a Petri dish) betrayed its unique provenance. Created over the course of five years at a cost of €250,000, the burger consisted of 20,000 strands of what Post called 'cultured beef' – in-vitro muscle tissue grown from bovine stem cells – mixed with some more familiar ingredients: egg and breadcrumbs for texture, plus saffron and beetroot juice for colour. Richard McGeown, the chef charged with cooking this precious puck of protein, scooped it up with the air of a man handling nuclear waste and lowered it gingerly into a pan of melted butter.

As the patty started to sizzle, a short film was shown explaining the science behind in-vitro meat. With cartoony graphics and a jazz-funk soundtrack straight out of the 'Dino-DNA' sequence in *Jurassic Park*, a velvety American baritone informed us that the muscle tissue for cultured beef is initially 'harvested' from a cow in a 'small and harmless procedure'. The fat and muscle cells are then separated and the latter dissected, causing them to self-divide. 'From one muscle cell, more than *one trillion* cells can be grown!' purred the voice. The cells then merge to produce 0.3-millimetre-long chains that are placed around a central hub of gel, where their natural tendency to contract causes them to bulk up, producing more muscle. 'From one small piece of tissue, *one trillion* strands can be produced!' the voice enthused, seemingly unaware of the repetition. 'When all these little pieces of muscle are layered together, we get exactly the same thing we started with: *beef*!'

Back in the studio, Chef McGeown pronounced the burger ready, serving it up on a white plate next to a desultory bun, slice of tomato and a lettuce leaf. 'Ladies first!' chirruped Hossain, pushing the plate towards Rützler, who tentatively cut off a small piece of patty, peered and sniffed at it and then put it into her mouth and began to chew. As this 'one small bite' moment of food history played out, Post explained how Winston Churchill had predicted all this back in 1931, in an essay in which he described how humans would one day 'escape the absurdity' of rearing whole chickens by growing the edible parts in a 'suitable medium'.[2] As Post warmed to his theme, it became clear to everyone else that the burger was burning Rützler's mouth. Unwilling to spit out her €50,000 payload, she gamely

swallowed and, in obvious pain, attempted to answer Hossein's suitably burning question, 'How did it taste?'

Rützler laughed nervously. 'I was expecting the texture to be more soft,' she said at last. 'There is quite some flavour with the browning. I know there is no fat in it, so I didn't know how juicy it would be, but it's close to meat … Er, the consistency is perfect … but *I miss salt and pepper*!' With this final outburst, Rützler passed the tasting baton to Schonwald, who soon brought his native burger-eating heritage to bear. 'The bite feels like a conventional hamburger,' he began, 'but it's a kind of unnatural experience, in that I can't tell you how often over the past twenty years I've had a hamburger without ketchup, or any kind of onions or jalapeños or bacon; but I think fat is a big part of what is missing … what was conspicuously different was flavour.'

Despite these mixed reviews, Post remained upbeat when asked by Hossein how he felt the tasting had gone. 'I think it's a very good start,' he said; 'this was mostly to prove we can do it. I'm very happy with it. It's a fair comment, that there is no fat in here yet, but we're working on it.' *We*, it emerged, included Google co-founder Sergey Brin, who now appeared in a short film to explain his hopes for the project. 'Sometimes a new technology comes along that has the capability to transform how we view the world,' he said. 'I like to look at the opportunity and see when it's on the cusp of viability.' Brin's speech might have been more uplifting had he not chosen to deliver it in his prototype Google smart glasses, which gave him the sinister appearance of a Bond villain. 'Some people think this is science fiction,' he went on. 'I actually think that's a good thing. If what you're doing is not seen by some people as science fiction, it's probably not transformative enough.'

Back in 2013, Brin was far from the only Silicon Valley CEO getting excited by lab food. That year was something of an *annus mirabilis* for the new tech trend, with Bill Gates announcing his support for no fewer than three start-ups: Nu-Tek Salt, which proposed to replace edible sodium with potassium chloride, Hampton Creek Foods (now renamed JUST), pioneers of the use of plant proteins to mimic eggs, and Beyond Meat, which did the same for chicken and beef. Gates' conversion had apparently come when he tried the latter's 'chicken-free strips' and found that he couldn't tell them from the real thing. 'We're just at the beginning of enormous innovation in this space,' he wrote on his website that year. 'For a world full of people who would benefit from getting a nutritious, protein-rich diet, this makes me very optimistic.'

As usual, Gates was right on the money. Today lab food is big business, with major players including Kleiner Perkins (key investors in Amazon and Google), Vinod Khosla (co-founder of Sun Microsystems) and Obvious Corp (set up by the founders of Twitter) all scrambling for a piece of the action. In just a few years, the science fiction has become reality, with the likes of JUST, Beyond Meat and Impossible Foods (the latter funded by Google, Khosla and Gates) all hitting high-end supermarkets and trendy restaurants in the US and elsewhere. In 2018, the UK got its first taste of 'bleeding' veggie burgers when those made by Beyond Meat – which, like Post's patty, use beetroot juice for their faux blood – went on sale in Tesco, selling out almost as soon as they touched the shelves. Meanwhile, back in the US reviewers raved about Impossible Food's even gorier fake-blood burgers, which use genetically modified yeast to produce heme (or haem), the compound that gives haemoglobin its name and makes our own blood red. In 2019, Impossible's patties hit the big time when Burger King launched its Impossible Whopper, 'flame grilled to perfection' just like its cow-based counterpart.

With sales of lab meat in the US already at $1.5 billion and projected to rise to $10 billion by 2023, the meat industry has been swift to react. While some producers have demanded that plant-based substitutes not be labelled meat (a rule that the State of Missouri became the first to pass into law in 2018), others, including major companies such as Cargill and Tyson, have taken the 'If you can't beat 'em, join 'em' approach, bankrolling start-ups such as Memphis Meats, which aims to grow in-vitro meat commercially, Post-style, in a lab.

What explains fake meat's meteoric rise? Apart from serious injections of cash, it has been largely fuelled by rapidly rising public awareness of the catastrophic effects of industrial livestock production. From the United Nation's ground-breaking 2006 report *Livestock's Long Shadow* to popular films like *Cowspiracy* and books including Jonathan Safran Foer's *Eating Animals* and recent reports such as the EAT-Lancet Commission's 2019 *Food in the Anthropocene*, a slew of increasingly alarming books, films and studies have emerged documenting the damage, cruelty and ecological lunacy of factory farming.[3]

Humans originally domesticated farm animals largely because the beasts could eat what we couldn't: cows and sheep happily grazed on grass while pigs and chickens gobbled kitchen scraps; after a few years spent in fields, on hills and in backyards – during which the bovines and hens provided us with the added bonus of milk and eggs – we could eat them. Provided one was comfortable with the inevitable endgame, it all created a beautiful, synergetic loop. Factory farming, by contrast, is almost comically inefficient. One third of the global grain harvest is now fed to animals, food which, if we ate it directly, could feed up to ten times as many people.[4] Industrial meat production guzzles one third of all the water used in agriculture and is responsible for an estimated 14.5 per cent of all greenhouse gas emissions.[5] Add in the pollution from the football-pitch-sized pools of toxic slurry and the indiscriminate use of antibiotics and you've got a hefty pile of hidden costs. Although the negative value of such damage is hard to estimate, one study by the Indian Centre for Science and the Environment reckoned that, if you factored everything in, the true cost of an industrial burger would be in the region of $200, not the $2 we usually pay.[6]

The ethical downsides of industrial livestock production are just as troubling. If the term 'factory farm' doesn't immediately arouse a sense of Orwellian disquiet, closer examination of these secretive facilities (known in the trade as concentrated animal feeding operations, or CAFOs) soon will. They are places in which tens of thousands of animals are crowded together and fed on grain and soy-based animal feed aimed at bringing them to slaughter weight as fast as possible. Most of us know deep in our souls that conditions on such farms are far from idyllic. Yet, as Jonathan Safran Foer argues, the price we are prepared to pay for meat directly affects the quality of life that the birds and beasts we eat enjoy, a price that, given Foer's nightmarish travels around various animal gulags in the United States, tends towards rock bottom. As one activist summed it up: 'These factory farmers calculate how close they can keep these animals to death without killing them. That's the business model.'[7]

If part of you still clings to the hope that most of the animals we eat lead happy lives, think again. Of the 70 billion livestock that ended up on our collective global plates in 2018, two thirds were factory farmed; in the USA, the figure was 99 per cent.[8] In order to get some idea of the staggering scale of this, one need only muse on the fact that, of all mammals on earth, 60 per cent are now farm animals, 36 per cent are human and the rest (just 4 per cent) are wild.[9] As such figures suggest, our carnivorous bent is threatening us and our planet.

This is precisely the crisis that Silicon Valley lab-food companies are trying to address. Josh Tetrick, the youthful CEO of JUST, is a committed vegan who began trying to replicate what he calls the 'twenty-two functionalities of an egg' (emulsifying, foaming, thickening and so on) after he discovered the appalling conditions under which most of America's 300 million egg-laying hens were kept. Realising that people weren't going to stop eating eggs any time soon, he wanted, in his words, to 'take the hen out of the equation'. In 2013 he launched Beyond Eggs, a plant-based egg substitute made from ingredients such as peas and oilseed with a longer shelf life, less cholesterol and, Tetrick hoped, a better taste than anything a hen could produce. That same year, Just Mayo went on sale in Whole Foods Market to positive reviews, followed in 2018 by Just Egg, a mung-bean-based substance that resembles scrambled egg when cooked and, if not quite beating the hens at their own game yet, is another step towards Tetrick's vegan dream.[10]

Impossible Foods, Beyond Meat, Beyond Eggs – the language of lab food has a curious air: one of adventure tinged with menace, a bit like some comic-book superhero had accidentally wandered onto the pages of *Brave New World*. The Silicon Valley culture from which it springs – warp-speed technology, megaton profits, ruthless competition and testosterone-fuelled CEOs on a mission to save the planet – has in the space of less than a generation come to dominate most aspects of our lives. So powerful and ubiquitous are the tech giants that it can be a shock to realise just how young they are: in lab food's breakthrough year of 2013, Google was just fifteen years old and Twitter and Facebook less than ten. Despite their youth, such companies wield extraordinary influence, not just over our shopping, communications and personal data, but over how we're likely to live in the future. With profits exceeding $100 billion in 2018, Google had plenty to invest in its newly branded research arm Google AI, leading design and development in every conceivable sphere of our digital existence from face recognition to driverless cars.[11] In retrospect, the question is not what got Silicon Valley into food, but what took it so long.

Whether you find the tech giants' recent obsession with food a cause for celebration or concern will partly depend on your general outlook on life. If you tend to believe that we humans are ingenious enough to invent our way out of any fix, then it's probably time to relax, grab a lab burger and buy shares in JUST and Google. If, on the other hand, you worry that we tend to respond to complex problems by seeking simple solutions, it's time to get very worried indeed. Never before have our lives been more complex, and never before have we been more dependent on technology to make them run. Our planet is in trouble, and a handful of global corporations want to control everything from the way we communicate, travel and inform ourselves to the way we eat. What could possibly go wrong?

As you've probably guessed, I belong to the latter camp. Although I'm no technophobe, I think we urgently need to review our relationship with technology, something I propose in this book that we can do through the lens of food. We humans learned to eat long before we invented technology, and many of our greatest advances have come through our attempts to feed ourselves better. Food and technology are twin pillars of our evolution, so they can help us understand how we arrived at our current predicament as well as guide us in shaping our future. Without further ado, therefore, let's return to Cedric Price's query at the head of this chapter: if technology is the answer, what was the question?

Meat Wave

‘How to live?’ is the likely answer. The oldest question on earth and one that underpins the actions of every living being, the problem of how to live is wired into our DNA. At its core is the question of how to eat, an issue fundamental to all living things. Trees, frogs, birds, fish and worms all need food, yet the problem for them is far less complex than it is for us. As conscious beings, we feel that there are ‘good’ and ‘bad’ ways to feed ourselves. We may not agree on what these are (indeed, wars have been fought over the question), yet eating, for us, has an inescapably ethical dimension.

At the global scale, the problem of how to eat is one we humans are yet to solve. After wrestling with it for the best part of two and a half million years, we still haven’t cracked it. We’ve made some spectacular breakthroughs – we’ve fashioned tools, tamed fire, invented farming, harnessed steam, modified genes – yet each advance has brought a new raft of problems in its wake. Today our supermarket shelves may heave with food, yet the system that fills them is in crisis. On our finite, overheating planet, the way we eat has trapped us in a vortex of self-destruction from which there is no easy escape. As Robert Malthus warned in his famously gloomy 1798 *Essay on the Principle of Population*, however much food we produce, we always seem to need more.

To compound matters, we’re not great at managing the food that we do produce. According to the United Nations Food and Agriculture Organization (FAO), farmers worldwide currently provide the daily equivalent of 2,800 calories of food per person – more than enough to go round, given an ideal food system.[12] Of course, no such system exists, which is why some 850 million people worldwide live in hunger and more than double that number are overweight or obese.[13] The causes of this imbalance are numerous and complex, yet in essence they boil down to the same ones that have dogged our efforts to feed ourselves from the start, namely aspects of geography, climate, ownership, trade, distribution, culture and waste – the very factors that have shaped our civilisations. The way we eat is inextricably linked to the social, political, economic and physical structures that govern our lives, which is what gives food its unparalleled complexity and potential.

Within the complexity, however, certain trends emerge. Developing nations, for example, struggle to produce enough food to feed their citizens, while developed ones tend to overfeed their people. Food waste is a global issue, yet its causes vary depending on where you are: waste in the Global South is mostly due to a lack of infrastructure, while in the North it is largely down to oversupply. The UK, France, Belgium and Italy provide 170–190 per cent of their citizens’ nutritional needs, while in the US a gut-busting 3,800 calories are available to every man, woman and child, almost double what can be safely consumed.[14] No wonder so many Americans are overweight, or that half of their food is wasted.[15] As Tristram Stuart pointed out in *Waste*, if Western nations limited their food supplies to just 130 per cent of their nutritional needs and developing states could reduce post-harvest losses to levels similar to those in the developed world, one third of the global food supply could be saved, enough to feed the world’s hungry twenty-three times over.[16]

To peel another layer off the food crisis onion, the global diet is changing. As people move to cities, traditional rural diets – typically based on grains and vegetables – are being swapped for Western-style ones with lots of meat and processed foods. The FAO predicted in 2005 that global consumption of meat and dairy would double by 2050, a prediction that remains stubbornly on track.[17] Nowhere is the transition more pronounced than in China, where 80 per cent of the population were rural in 1980, yet 53 per cent now live in cities and 70 per cent are projected to do so by 2025.[18] Back in 1982, the average Chinese ate just 13 kilos

of meat per year; today the figure is 60 kilos and rising. Although this is only half what the average American eats, it still means that the Chinese today consume one quarter of all the world's meat and twice as much as the burger-lovin' USA.[19]

In the West, it can be hard to grasp how much meat we eat, since the animals that once grazed in our fields have largely disappeared. Strolling through the British countryside, you could be forgiven for thinking that the entire nation has gone vegetarian, so rarely does one see a cow or sheep. Partly thanks to this mental and physical distancing, many of us live in a state of denial when it comes to our furry and feathered friends: we love our cats and dogs, yet condemn millions of chickens and pigs (the latter being just as feeling and intelligent as our canine companions) to lives of misery. Although welfare standards vary across the world (and British farms have some of the highest), few of us check to see whether the contents of our bacon sarnie came from a 'happy' pig.

Why are we so blind to the truth of food? One answer is that it suits us not to have to think about it too much. To live in blissful ignorance of what it takes to sustain life was once the privilege of the rich; now, thanks to cheap convenience food, most of us can do it. While some might argue that such blitheness is the crowning achievement of industrialisation, it is also symptomatic of a deep moral malaise. Only a scandal on the scale of 'Horsegate' (when cheap meat pies in Europe and elsewhere turned out to contain illegal horsemeat) is enough to wake us from our gastronomic slumber. Immediately after the scandal, British independent butchers reported sales up 30 per cent, as people abandoned cheap pies and sought better alternatives. The renaissance didn't last long, however: sales of pies were back to normal within months, leaving only traces of the crisis in the form of typically British humour. *Waiter*: 'Would you like anything on your burger, sir? *Customer*: 'Yes please, a fiver each way.'

Our dedication to meat-eating is precisely what Mark Post and others hope to address with their lab-grown alternatives. For Post, the advantages of cultured beef are clear: 'It tastes the same, it has the same quality, it has the same price or is even cheaper; so what are you going to choose?' he asks. 'From an ethical point of view, it has only benefits.'[20] Admirable though Post's intentions are, the ethics of lab meat are rather murkier than he makes out. To begin with, cultured beef is grown in bovine fetal serum so, unlike plant-based haem, it still involves the use of animals, albeit on a far smaller scale than conventional beef. Next, there is the squeamish element: the question of whether growing edible muscle tissue in a lab is really an avenue we want to pursue. Last but not least is the problem of ownership: despite Google's unofficial slogan 'Don't be evil' (now modified to 'Do the right thing'), do we really want our food to be made and owned by the same global corporation that controls how we access and share information? And if we don't, who else do we imagine might own the technologies required to make in-vitro beef? Not your friendly local farmer or butcher, that's for sure. If lab meat succeeds – and all the signs are that it will – it is sure to be patented up to its eyeballs and to make profits at least as eye-watering as the software on your smartphone.

So what about plant-based meat alternatives made by Beyond Meat, Impossible Foods and the rest? While less obviously questionable on the ethical front, the jury is still out on whether the mass consumption of such products would really be good for us or the planet. According to its own website, Impossible's Whopper contains: 'Water, Soy Protein Concentrate, Coconut Oil, Sunflower Oil, Natural Flavors, Potato Protein, Methylcellulose, Yeast Extract, Cultured Dextrose, Food Starch Modified, Soy Leghemoglobin, Salt, Soy Protein Isolate, Mixed Tocopherols (Vitamin E), Zinc Gluconate, Thiamine Hydrochloride (Vitamin B1), Sodium

Ascorbate (Vitamin C), Niacin, Pyridoxine Hydrochloride (Vitamin B6), Riboflavin (Vitamin B2), Vitamin B12'. Hardly a list of ingredients that Granny would have recognised, let alone trusted.

None of this is to say that lab meat or fake meat is necessarily all bad; on the contrary, anything that promises to end factory farming has to be worth a shot. The problem, as Robert Oppenheimer realised, is that what seems like a good idea in a lab can have unforeseen consequences in the real world. Like dogs, technologies tend to obey their masters, and the behaviour of our current tech giants doesn't exactly inspire confidence in their fitness to control our future food.

The fact that growing muscle tissue in a lab could seem a better idea than simply eating more vegetables reveals the nature of our human dilemma. For millions of years, we've co-evolved with technology, becoming what we choose to call *Homo sapiens* in the process. We wouldn't exist without tech and couldn't survive without it, yet now our co-evolution has hit the buffers. In our bid to solve the problem of how to eat, we've complicated the greater one of how to live. When it comes to tackling that, technology is no longer the limiting factor: we already know how to feed the world, warm and cool our houses and cure disease; what we lack is the capacity to put our ideas into effective practice – to collaborate, share and learn from our mistakes. The areas where we most urgently need to invest and invent aren't technological, they're *human*.

A Good Life

> One cannot think well, love well, sleep well, if one has not dined well.
>
> Virginia Woolf[21]

One question that technology can never answer on our behalf is what makes a good life. The question is central to everything we do, since all our choices and actions are effectively made in response to it.[22] When and how we eat, drink, work, think, walk, talk or check our phones are all decisions steered towards some conscious or unconscious idea of the good. Even when we're asleep, our brains churn away at problems that we failed to solve during the day. Our quest for a good life is one that we can never escape.

When we're hungry, thirsty, cold, ill or in danger, the quest becomes a matter of survival. Food, water, warmth, medicine and shelter present themselves as vitally precious 'goods', as they have been much of the time for most humans in history. Those of us living comfortable lives in the West today are thus something of an anomaly: death, for us, is more likely to come from the so-called 'diseases of affluence' – cancer, heart disease, diabetes or dementia – than from war, violence, starvation or plague. By helping us fight death, technology has distanced us from our own mortality, to the extent that the subject has become largely taboo.

Once survival is assured, the question of how to live becomes increasingly complex and abstract. Although still obliquely concerned with survival *(Have we run out of cornflakes?)*, our choices tend towards more intangible aims, such as that of finding happiness. Notoriously hard to define, let alone achieve, happiness is the ultimate tease, universally desired yet rarely possessed. Padding around our heated homes surrounded by computers, dishwashers and microwaves while barking commands at Alexa to play our favourite music, the tacit assumption is that we *ought* to be happy, yet for a plethora of reasons – stress at work, money worries or a pervading sense of loneliness – we can often feel the opposite.

As Richard Layard noted in *Happiness*, the relationship between joy and wealth is far from linear. Once we've reached a certain level of comfort – what is needed for basic subsistence – increased riches don't make us any happier. Indeed, Layard found, despite average incomes in the UK, US and Japan having doubled in the fifty years to 2005, levels of happiness had remained constant.[23] Such findings suggest why even those of us lucky enough to have full bellies, snug houses and smart gadgets feel compelled to reach for something more: love, meaning, fulfilment, purpose. Yet the harder we search, the more unreachable such things can appear. Music, art, astronomy, poetry, philosophy and religion are just some of the outcomes of our yearning, along with base-jumping, Xbox, cryptic crosswords, drugs and alcohol.

Humans are complex beasts, so how can we hope to flourish? Among the first to pose this question was Socrates. Famously provocative and ugly as well as charming and witty, Socrates plagued his fellow Athenians with constant questions about the meaning of life, gleefully picking holes in their answers. He pursued this course because he believed that our greatest task as humans was to learn to use our brains. Needless to say, his efforts didn't go down too well among the ruling elite, who eventually put him on trial for 'corrupting the minds of youth'. In a famous speech, Socrates defended his actions by saying that his greatest insight after a lifetime of enquiry was to realise that he knew nothing. Even so, he said, such questioning was everyone's duty, since a 'life without this sort of examination is not worth living'.[24]

Socrates' devotion to philosophy cost him his life, yet his ideas would prove far harder to snuff out. His relentless search for the meaning of good, immortalised in the *Dialogues* of his faithful pupil Plato, spread throughout Athens, which as the world's first democracy made an ideal context in which to conduct such an enquiry. The real-life city formed the basis of Plato's utopian work *Republic*, which in turn inspired his pupil Aristotle to write his *Ethics*, the first practical guide to leading a good life.

Aristotle agreed with Plato that the guiding principle of life was a search for the good. 'Every art and every investigation, and similarly every action and pursuit, is considered to aim at some good,' he wrote. 'Hence the good has been rightly defined as that at which all things aim.'[25] What then, wondered Aristotle, was the ultimate good for a human? Surely it must mean perfecting our greatest faculty, namely reason? Only through reason, said Aristotle, could we lead virtuous – and thus happy – lives, using it to help us navigate the various pitfalls that life would inevitably throw at us. The key to this was to find a balance in all things, starting with ourselves: if we were naturally impetuous, for example, we should seek patience; if timid, we should try to be braver. Through such efforts, we could perfect our souls and thus achieve virtue, steering a straight path through life much as Odysseus had done when sailing between the monstrous rock and whirlpool of Scylla and Charybdis.[26] If humans were ships and life the sea, then the good was our lodestar and reason our rudder.

No Greek philosopher ever pretended that leading a good life was easy. On the contrary, the idea that it took much courage and effort was axiomatic. The Greek word for happiness, *eudaimonia*, translates as something like flourishing; it was an active, not a passive, state. For Aristotle, this was especially important, since humans were 'political animals', which meant we could never thrive in isolation: in order to be happy, we needed one another. Whatever was good for us had to be good for society as a whole. We may not agree on what that meant, said Aristotle, yet we must still try to find common ground – this, indeed, was the ultimate aim of politics.

As Socrates' fate suggests, not all Athenians felt at ease with such ideas. Yet if leading a virtuous life was hard in ancient Athens, try doing it in contemporary London. In a post-industrial society it is virtually impossible to lead a truly good life, since, merely by existing, we participate in a host of social, political and economic systems that, among other things, oppress workers, abuse animals, poison oceans, destroy ecosystems and churn out greenhouse gases like there's no tomorrow. Heaven help you if you drive a car, fly on holiday, eat steak or own a smartphone. Almost every move we make in the modern world has some distant, negative impact. Just engaging with life's multiple dilemmas requires vast knowledge and effort, as we examine all the implications of our actions on countless people, creatures, structures and organisms, most of which we barely know exist. Needless to say, few of us are equipped for such a task.

What advice might Socrates have given us to help us cope with modern life? His first suggestion might be that we learn to love paradox. Our lifelong pursuit of elusive goals is, after all, pretty paradoxical. Acceptance of the human condition was, for Socrates, the basis of a good life, as it was for his Indian near-contemporary Gautama Buddha. Both men were founders of a tradition of humanist thought that holds such acceptance to be the key to happiness. The idea may sound earnest, yet it is the necessary counterpart to that other great strand of humanism – which remains arguably our best defence against life's vicissitudes – humour. In Douglas Adams' 1970s radio series *The Hitchhiker's Guide to the Galaxy*, for example, a computer called Deep Thought is built for the purpose of answering the question 'What is the meaning of Life, the Universe and Everything?' Deep Thought takes 7.5 million years to come up with the response '42'. When accused of giving a meaningless answer, the computer admits as much, but defends itself by saying that the people who programmed it hadn't understood the original question.[27]

After Easter

Our modern lives are beset by paradox. Our technical capacity is mind-blowing, yet we seem unable to match our skills at, say, genetically modifying sheep, landing probes on comets or making robots serve sushi with non-technical challenges such as creating equitable societies, agreeing to disagree on God or coexisting with fish. In psychological terms, we've developed our 'hard' skills at the expense of our 'soft' ones; in metaphorical ones, we've allowed the technical tail to wag the philosophical dog.

Our dilemma is made worse by the fact that our lives are so dominated by technology. Two thirds of us now own a smartphone, a statistic that underlines the global reach of the digital revolution. The Internet has transformed our lives more profoundly and rapidly than anyone (other than media prophet Marshall McLuhan) could have foreseen. Today we live in a Global Village in which Google is the marketplace, Amazon the general store, Facebook the garden fence and Twitter the local gossip. In the blink of an eye, activities that once only took place in towns or cities can be carried out with a flick of the thumb from a desert, ocean or plane.

Nobody knows where our digital lives will lead. Our screen obsession has already changed our social behaviour and the way we think. Now that the giddy thrill of digital life is starting to subside, its dark side is becoming ever clearer, with reports of cybercrime, self-harm sites, Internet trolls, political propaganda, personal surveillance and data mining coming at us from all sides. The broadening of our communicative horizons has come at the partial cost of our freedom; what once appeared as an innocent new public domain has turned out to be anything

The Endless Meal

Contemplating food is something we rarely do in the modern world; industrialisation has done its best to obscure the origins of what we eat. Thinking about what food really is can make us feel uneasy, since it brings us uncomfortably close to examining the nature of our own being. This was, however, the precise realisation that propelled Charles Darwin towards his greatest discovery. Struggling to explain the great variety of species on earth, it dawned on Darwin that competition for limited resources meant that only those creatures most suited to a particular environment would survive to reproduce. 'Survival of the fittest' would lead to specialisation that over time would evolve into a profusion of different species.

Darwin's thinking led him to a disturbing conclusion: stripped of table manners, man's need for food was no different to that of any other creature. All species, including humans, he realised, were in competition for the same resources. The need to eat thus joined all living beings in a perpetual mutual carnage, such as that which underpinned even the most seemingly innocent springtime scene:

> We behold the face of nature bright with gladness, we often see superabundance of food; we do not see, or we forget that the birds which are idly singing round us mostly live on insects or seeds, and are thus constantly destroying life; or we forget how largely these songsters, or their eggs, or their nestlings, are destroyed by birds and beasts of prey; we do not always bear in mind, that though food may now be superabundant, it is not so at all seasons of each recurring year.[34]

The fact that Darwin was reading Malthus's *Essay on the Principle of Population* when the penny dropped was no coincidence. Malthus had argued that populations were limited by the amount of food available, which meant that, since populations grew geometrically while food supplies increased only arithmetically, humans were doomed to eventually run out of food. If society were to avoid the misery of 'positive checks' on population growth (hunger, disease and war), it would have to reduce the number of people through the exercise of 'moral restraint', aka birth control. Malthus's theories proved instantly controversial and have remained so ever since, yet they provided Darwin with a key part of his evolutionary puzzle. To the idea that humans and animals had evolved from common ancestors he added the notion that the struggle for life was in effect a never-ending meal in which all living beings took part.

The 1859 publication of *On the Origin of Species* lobbed a grenade into the heart of natural science. The idea that men were somehow physically and genetically bound to their fellow creatures was one that most Victorians found hard to stomach. Yet, despite its rocky reception, Darwin's theory shifted the axis of thought concerning man's relationship with nature, with insights that remain powerful even today. Whenever we earthly creatures eat, we eat together; furthermore, we eat one another. Food consists of living things that we kill in order to live – provided we have the means and desire to eat them.

Humans don't only kill for food, of course; alone among species, we also grow and breed the things we eat. This makes the question of feeding ourselves doubly tricky. A lion doesn't lie awake at night worrying about whether or not it should have eaten that baby gazelle; for a lion, how to eat is a practical, not a moral problem. Yet, as Darwin noted, the effects of the lion's decisions over time will nevertheless teach it how to eat: if it guzzles too many gazelles, it will eventually run out of food. When it comes to keeping a balance between eaters and eaten,

nature has ways of maintaining the status quo.

For us, however, it's a different story. Thanks to modern agriculture and medicine, we've dodged the famines and pandemics that Malthus predicted would naturally curb our numbers, leading to an unprecedented population explosion. During the twentieth century alone, our numbers rose from 1.7 billion to over 6 billion, a growth made possible in large part by the 1909 discovery by the German chemist Fritz Haber of how to 'fix' atmospheric nitrogen (i.e. turn it into the compound ammonia) and so make it available to plants. Artificial nitrogen is the key ingredient in chemical fertilisers commonly known as NPK, so named since they also contain phosphorus (P) and potassium (K).[35] Today, the so-called Haber–Bosch process (Carl Bosch industrialised Haber's idea) is credited with feeding an estimated two out of every five people on the planet.[36]

Malthus's critics argue that such technical breakthroughs blow his theory sky-high. Had he lived to see modern agriculture, they claim, he would have realised the error of his ways. Malthus was just a misanthrope who failed to see that human ingenuity will always triumph. Malthusians counter this argument by pointing out that, while the Haber–Bosch process is undoubtedly clever, the practice of bombarding the soil with chemicals doesn't do it any good in the long run. Indeed, by providing the means by which the population has grown exponentially, it merely ramps up the pressure on other natural resources upon which we also rely. Man cannot live on NPK alone.

Having had the temerity to mention food, death and morality all in the same breath, Malthus is, perhaps inevitably, the figure around which the 'feed the world' debate tends to galvanise. By raising the issue of population, he ventured into territory that for many remains taboo even today. Yet to discuss how we should eat *without* addressing the question of population is at best limited and at worst meaningless, since the two problems are so obviously connected. Malthus may have been a doom-mongering pessimist, but his theory is yet to be proven wrong. However responsibly we farm, fish, hunt or gather, our appetites continue to shape the planet and affect the life chances of us and our fellow earthlings.

Adam's Apple

In order to live we must eat; in order to eat, we must take life. This circularity may seem remote when most of our food comes ready-cooked in boxes, yet its logic underpins our very existence. Whenever we eat, we make an implicit value judgement: that human life is worth more than that of, say, a leek. Most of us agree on this: it is, after all, the basis upon which we all, including vegans, sustain ourselves. But what of lamb? Vegetarians draw the line here, although they still eat eggs and cheese, the production of which also involves the taking of animal life. Carnivores eat lamb, although conscientious ones will insist that the animal has had a good life and (so far as such a thing is possible) a good death first.

Such thoughts are hardly appetising, so it is fortunate that we don't have to construct the ethical universe every time we want to eat breakfast, any more than we have to work out how to start a fire or make toast. Our ancestors did all the hard work for us, both by learning which plants and animals were edible or poisonous (not a job high on the health and safety index) and by creating the framework within which we still eat today. The complex array of rules, habits, skills, knowledge, dos and don'ts that they've handed down to us is what we call food culture.

Our ideas about food are shaped by this cultural frame to such an extent that only *in extremis* (and sometimes not even then) can our concept of what is or is

not edible be shaken. A notorious problem with food aid, for example, is that people used to eating certain foods such as yams might refuse well-meant gifts of wheat, even to the point of starvation. Wheat, to them, is simply not food. Occasionally, however, a crisis can override even the strictest norms, as was the case during Sir John Franklin's doomed 1845 expedition to find the North-West Passage. Trapped in the ice, the crew became so desperate that some resorted to cannibalism, yet seemed unable to seek help from the local Inuit, who lived perfectly well in those icy climes. The Inuit reported seeing starving sailors staggering past in an attempt to escape their plight without thinking to stop and ask them for aid.

Even in secular societies, our ideas of what can and cannot be eaten are powerfully reinforced by myth. In the Judeo-Christian world, for example, the rules are laid out in the very first chapter of Genesis, in which God establishes man's dominion over his fellow creatures by telling Adam, 'See, I have given you every plant yielding seed that is upon the face of all the earth, and every tree with seed in its fruit; you shall have them for food.'[37] Adam is thus created vegan, and his home, the Garden of Eden, is a fruitarian paradise in which he and Eve are free to wander at will. There is, however, a catch: 'You may freely eat of every tree of the garden,' warns God, 'but of the tree of the knowledge of good and evil you shall not eat, for in the day that you eat of it, you shall die.'[38]

Eve can't resist the forbidden fruit, of course, leading to the Fall of Man which marks the start of the human story in the Bible. Cast out of Eden, Adam and Eve are condemned to farming: a way of life considered far harder than hunting and gathering in the ancient world. As a result, they become omnivores, a transition that brings its own burden of woe for their sons, when God prefers Abel's sacrifice of lamb to Cain's offering of grain, leading to a fit of jealousy in which Cain murders his brother.

Food features heavily in Genesis for good reason. The narrative mirrors our human journey from hunter-gatherer to farmer and citizen, documenting the struggles and sacrifices that must be made along the way. As life gets progressively more complex, the protagonists wrestle with a succession of Aristotelian dilemmas: between innocence and knowledge, freedom and obedience, power and responsibility. Life is presented as a series of tests which people usually fail, yet in the process of facing such challenges, they become ever more human. Crucially, the whole journey begins with the dawning awareness of good and evil: living with such knowledge, the story suggests, is humanity's unique burden.

With the exception of a few dietary quibbles, the Old Testament establishes the right of humans to be omnivores, an assumption that still prevails in the West. Other traditions, however, have viewed things very differently. In India, for example, vegetarianism has long been customary, since Buddhists, Jains and Brahmins all reject animal slaughter, while Hindus avoid both beef and pork, and Muslims eschew the latter. India's sacred cows are a striking symbol of this different belief system: revered for their life-giving milk, the animals wander freely and are fed by people as they pass. As Reay Tannahill explained in *Food in History*, the origins of such food cultures are often to do with practicality (cows were rare on the Indian subcontinent and could feed many more people if kept alive). Yet they also reflect very different views of life itself: in the Hindu Vedas, for example, all living things have souls that are endlessly reincarnated depending on their karma, a spiritual force influenced by earthly acts, especially violent ones.[39]

Such a world view naturally makes the business of eating rather tricky. Jains, for example, practice *ahimsa*, or non-violence, so meat, fish, eggs and dairy are off

the menu. The eating of honey is forbidden, since it is considered harmful to bees, and strict adherents also avoid tubers, on the basis that microorganisms might be harmed when digging them up, which cuts out potatoes, onions and garlic. At its most ascetic, the Jain diet thus consists only of fruit and vegetables, nuts, pulses and grains, permitted on the basis that no human can exist without taking at least *some* life.

The contrasting world views of East and West are reflected, as one might expect, in similarly divergent attitudes towards mortality. While we in the West try to prolong our lives at any cost, a Jain who feels that she has accomplished all that she can in this life may perform the highly respected act of *santhara*, a deliberate fasting to death. To a Westerner, such a deed might seem puzzling or tragic; to a Jain, our tendency to cling to life would seem equally bizarre. Our world views are shaped by the cultures into which we are born, yet whatever our outlook on life, our common need to eat transcends them all.

The Modern Epicure

> Nothing is sufficient for the person who finds sufficiency too little.
>
> Epicurus[40]

For the Greek philosopher Epicurus, satisfying one's appetite was central to living well. In his garden overlooking Athens, Epicurus welcomed men and women from all walks of life, including slaves, to share a simple meal of home-grown vegetables, bread and water with him, perhaps with some cheese and wine, to be eaten while discussing life, the universe and everything. Learning to savour such simple pleasures, Epicurus believed, was the key to happiness. Rarely has an idea been so widely misrepresented: today, an epicure is synonymous with a gourmand, someone whose refined tastes, knowledge and wallet allow them to appreciate the very finest that haute cuisine can offer. To Epicurus, however, such sophistication was a guaranteed road to ruin:

> When I say that pleasure is the goal of living, I do not mean the pleasures of libertines or the pleasures inherent in positive enjoyment … I mean, on the contrary, the pleasure that consists in freedom from pain and mental agitation. The pleasant life is not the product of one drinking party after another or of sexual intercourse with women and boys or of sea food and other delicacies afforded by the luxurious table.[41]

If you read these lines, as I did, with a twinge of disappointment, you may struggle to live according to the strictest Epicurean principles. There is, however, more method – and joy – to Epicurus' asceticism than meets the eye. Like animals, said Epicurus, we find pleasure in simple acts, such as satisfying our hunger and thirst. When we enjoy a cool drink after a long hot walk, for example, we feel a surge of pleasure as our thirst is quenched. We experience such pleasures as a natural good, which is why humans, like all other animals, are natural hedonists. Since we instinctively register such pleasures as good and pains such as hunger or thirst as bad, such sensations have inherent value for us.

Most of us can probably go along with Epicurus thus far – few of us, after all, need much prompting when it comes to seeking pleasure. But here is the rub: for Epicurus, the pleasure to be gained from satisfying one's appetite with a simple meal of bread and water was *as good as it gets*. Any attempt to crank up the hedonometer by adding some tangy goat's cheese or fragrant wine did not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Body

Weighing In

'OK, let's do this!' Pam, a fit-looking thirty-something blonde, smiles at me encouragingly. I take a deep breath and climb onto the scales. As usual, the result is somewhat dispiriting. 'Is that what you were expecting?' asks Pam, a note of sympathy in her voice. Actually, it was. Like most people who love their food, I've got a fair idea of what I weigh, and it's usually too much. Along with millions of others, I've spent much of my life on a variety of diets. Atkins, Dukan, 5:2: I've tried them all, and most have worked, at least for a while. But like waves on a rising tide, the pounds have always crept inexorably back. The fact that I'm fond of bread, butter, cheese, chocolate, potatoes, pasta and wine – indeed, pretty much all food – doesn't help. Nor does the fact that I spend most of my life sitting at my desk. There is, however, one diet that I've never tried, largely because the idea of being weighed in public and paying for the privilege has never appealed to me. But since I've exhausted all other options, I now find myself at my first Weight Watchers weigh-in.

'This is all about making food work for you!' says Pam with the eagerness of a convert. 'You can eat all your favourite foods and tailor the diet to suit you; just plan your meals ahead and track what you eat. *Good things are coming!*' Based on my current weight, Pam allocates me 29 daily 'food points' that I can 'spend' in any way I like, with an additional 49 for treats throughout the week. She hands me a small booklet, not unlike a ration book, in which hundreds of foods are scored according to their relative sinfulness. I glance down the list to see what this is going to do to my regime. Most fruit and vegetables are 'free', which is good, but other items mount up pretty fast: a skinless chicken breast is 4 points and a small glass of wine ditto, while a 40-gram piece of cheddar (the miserly match-box sized amount one used to get served on a plane) is 5. My favourite late-evening snack of cheese and biscuits is clearly going to have to go, but I guess I already knew that.

Pam shows me a picture of herself taken three years ago, when she was three stone heavier. She looks smiley and chunky in the picture, much as I did during the chubbier phases of my fourth decade. I tell her I am impressed by the transformation. 'Yes, that was me,' she says in the sort of wistful tone one might use to describe a long-lost family pet. 'Rather different to now.' The fact that Pam has maintained her 'goal weight' for several years means that she can now act as a Weight Watchers leader, living proof that this diet can really work. In this, she is following in the footsteps of Weight Watchers' founder, American housewife Jean Nidetch, who in 1961 asked her friends to help her lose weight by coming to weekly weigh-ins at her house. When she successfully shed the pounds, Nidetch had the idea of setting up similar meetings for other women, using her own example to inspire others. Today, 40,000 such meetings are held each week worldwide, attended by one million members.

As I chat with Pam, the room, which is in a Salvation Army building in central London, starts to fill with people coming for their weekly weigh-in. Apart from one American man who just seems to be here for a natter, all are women. They come from all walks of life, young and old and all shapes and sizes, but none of them is vast; I suppose the fact that they are prepared to give up their lunch break in order to be here explains why. Some are regulars whom Pam greets by name; others


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VINTAGE
20 Vauxhall Bridge Road,
London SW1V 2SA

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