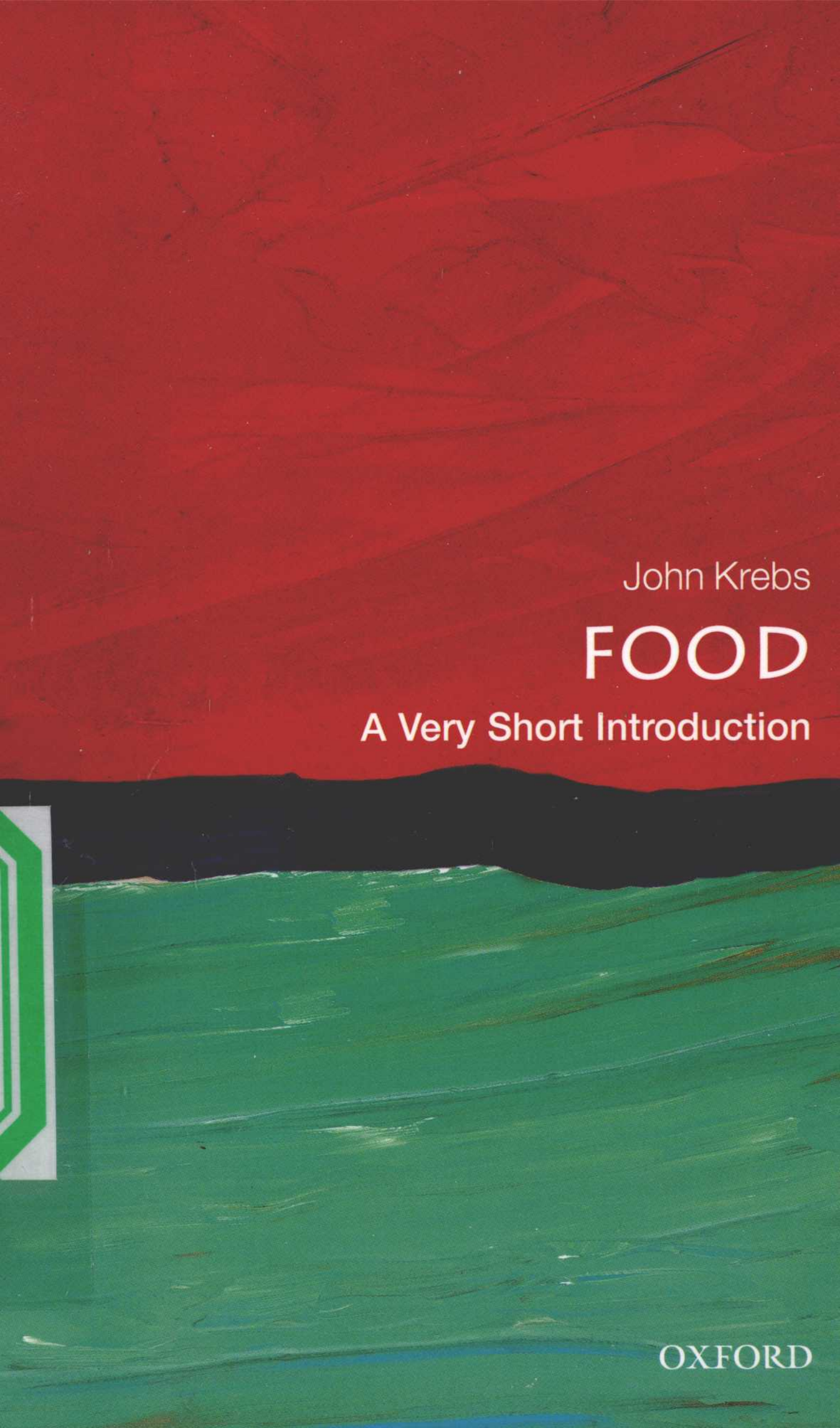
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Preface

Everyone has a view about food, which is not surprising given that we eat in the region of 1,000 meals a year. Some people treat food simply as fuel, and do not take too much notice of what they are eating, but given that you have opened this book, you may be someone, like me, for whom food is a source of pleasure and fascination.

Think of the best dish you have ever eaten. Perhaps it was a chicken curry, or a delicious chocolate cake, or pasta with tomato sauce?

These dishes raise many questions about food. What is it about certain foods that makes them so delicious? Why is Indian food so spicy? Why do some people like spicy food while others don't? Why do so many people like chocolate? How is it that Italian food often contains tomatoes, a plant from South America? Why is rice the staple food for half the people on the planet? All the three dishes that I listed are prepared by cooking: when did cooking start?

I hope that you will find answers to these and many other questions as you read this book. As you read, you might wish to bear in mind that the question 'why?' can be answered in different ways.

For example, take the question 'Why do all humans tend to like fat, sugar, and salt?'

One way to answer is to talk about survival value. Fat and sugar, both crucial sources of energy, were important for survival in our evolutionary past, and there was therefore natural selection for an inbuilt preference for these components of our diet. Likewise, sodium and chloride ions, the components of salt, are essential constituents of body fluids and are lost each day in sweat and urine, so need to be replenished.

Another kind of answer refers to the sensory mechanisms that underlie our preference for these foods. We have taste receptors for sugar and salt on our tongue, and the 'mouth feel' of fat is rewarding. Our preferences are influenced by sensations in our mouth, but also by other senses such as sight, sound, and smell.

Still a third way to answer the question is in relation to how our childhood and social experience influence our food preferences. Sugary, fatty foods are often associated with treats for children. Perhaps part of our adult preference stems from these childhood experiences.

The book combines science, history, and culture. If it gives you a taste for more, it will have achieved its aim.

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Chapter 1
The gourmet ape

Introduction

The traditional Inuit of the Canadian Arctic were almost entirely carnivorous. They hunted for seals, whales, birds as well as land mammals such as caribou, and ate only small amounts of plant food. Some traditional Inuit populations, it is estimated, obtained about 99 per cent of their energy intake from animal foods. On the other hand, approximately one-fifth of the people in the world never eat meat. For many this is because they cannot afford it, for some because their religious beliefs prohibit it, and for others because of perceived health, ethical, or environmental benefits. Most of us live between these extremes, eating a mixed diet that includes meat, dairy products, and plant-based foods.

The great variation between populations and individuals in the make-up of their diet raises the question of whether or not there is such a thing as a 'natural diet' to which the human body is adapted, or whether we are just extremely flexible. There are those who suggest that the best diet is the so-called 'paleo diet'. This is based on the argument that we are genetically adapted to the diet of our hunter-gatherer ancestors, because for about 99.5 per cent of human history we have existed as omnivorous hunter-gatherers, eating a mixture of fruit, nuts and seeds, roots, tubers, and a large

variety of animals. But given that present-day humans appear to be able to survive well on such a wide range of foods, it seems more likely that our omnivorous past has left us with flexibility to cope with many different food sources. In this chapter I will explore the diets of ancestral hominins, our closest relatives in the fossil record, and highlight the major changes that have led to today's diets. To prepare the ground, let us begin with a very brief summary of the evolution of the human species.

Human evolution

Homo sapiens, modern man, first appeared in the fossil record between 200,000 and 250,000 years ago. The evolutionary history of humans both before and after the appearance of *Homo sapiens* has been pieced together from a small number of fossils of differing ages from different parts of the world. The fossils may be tiny fragments, such as the piece of bone, about 40,000 years old, from a fifth finger, discovered, along with a molar tooth, in the Denisova Cave in Siberia in 2008. Working out how the various fossil remains relate to one another is rather like trying to guess what the picture in a completed jigsaw would look like without having seen the cover of the box and with only a few random pieces laid out on the table.

There is a further complication. Not only is it a challenge to decide how different species of fossil hominins are related to one another, but also it is often difficult to determine whether or not different fossils belong to the same or different species. Some paleoanthropologists who study human origins are 'lumpers', tending to assign many skeletons and fragments to just a few species, whilst others are 'splitters', dividing the fossils into many different species. So different accounts of human evolution interpret the fossil record in very diverse ways.

Within the past twenty years or so, a powerful new tool has been deployed in the study of human origins: the analysis of ancient DNA recovered from fossil remains. The oldest useable DNA

extracts are from human fossils are about 80,000 years old, but technical developments are pushing the time limit further back, especially for very well preserved remains. The degree of similarity between the DNA extracted from a fossil and that of modern man can be used to estimate how far back in time the fossil and modern man shared a common ancestor. For instance, the Denisova fossil, referred to above, shared a common ancestor with *H. sapiens* about 1,000,000 years ago, suggesting that it is a separate species. Similarly Neanderthal man, *Homo neanderthalensis*, is now known to have been a distinct species that separated from *H. sapiens* about 600,000–700,000 years ago.

To greatly simplify the story of our ancestry, most experts think that the direct precursor of *H. sapiens* was a species called *Homo erectus*, which first appeared about 1.8 million years ago. The taxonomic 'splitters' link *H. erectus* and *H. sapiens* with an intermediate species called *Homo heidelbergensis* that appeared about 800,000 years ago. *H. erectus*, although it had a smaller brain and would have been rather heavy-browed, looked sufficiently similar to *H. sapiens* for some anthropologists to have quipped, with slight exaggeration, that if you dressed *H. erectus* in modern clothes no one would notice him in the supermarket.

Further back in time, our ancestors included *Homo habilis* (nicknamed 'Handy Man' by its discoverer Louis Leakey, because it made stone tools), that lived in East Africa from about 2.4 million to 1.4 million years ago, and possibly *Australopithecus afarensis*, made famous by the skeleton of 'Lucy', that lived, also in East Africa, between three and four million years ago. The australopithecines, although bipedal, were very ape-like in appearance and were only about 1–1.3 m tall. If they were around today we might well see them in the zoo, alongside other, more distant relatives such as the chimpanzee. Many species of hominins existed, some in different parts of Africa, during this period and no one is sure which was the direct ancestor of modern man.

The diet of our ancestors

What did the australopithecines, and early species of *Homo*, eat? We can infer their diets from a combination of pieces of fossil evidence: teeth, tools, and chemicals. Although the digestive tract is not preserved in fossils, there are a few fossil skeletons of hominins that show indirectly how large the intestines were by the shape of the ribcage. Present-day great apes that eat low-quality plant food have a large digestive tract for absorbing nutrients and a large ribcage to accommodate their guts. I will return to this later when I discuss cooking.

The teeth of different species of mammals are clues to their diet. For instance, the cheek teeth, or premolars and molars, are quite different in a sheep and a dog: sheep have flat-topped molars with rows of ridges for grinding up tough grasses, whilst dogs have pointed molars for chewing meat. The front teeth, incisors and canines, tell a similar story. Sheep have sharp, flat-topped incisor teeth for cutting grass and have no canine teeth at all, while dogs have pointed canines and incisors that are well suited to tearing meat. The teeth of early hominins going back to 3.5 million years ago were neither the teeth of a pure herbivore, nor those of a pure carnivore, so they could have been the all-purpose teeth of an omnivore. It is not possible to go beyond this broad generalization and say what proportion of the diet was animal or plant, or to say which particular kinds of plants and animals were eaten.

The microscopic patterns of wear on the grinding surface of fossil teeth also tell a story about diet. Broadly speaking, wear patterns that are a complex mixture of tiny pits and scratches of different orientations, referred to as 'surface complexity', indicate a diet that included hard seeds, nuts, and other brittle items, whilst a wear pattern of many fine parallel lines, known as 'anisotropic wear', suggests a diet of tough vegetation such as grasses and sedges, ground by the teeth moving back and forth like a sheep's teeth.