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New York Times bestselling author of
The Great Warming



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to the First Modern Humans

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FIRST MODERN HUMAN

Brian Fagan



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To
Francis and Maisie Pryor
Archaeologists, gardeners, and sheep farmers,
with affection and respect and with thanks for many good laughs.
After all, they have turtles named after them . . .

A sudden intense winter, that was also to last for ages, fell upon our globe.
Louis Agassiz, *Geological Sketches* (1866)

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Preface

FOUR DOTS MOVE ALONG A RIVERBANK in a black and gray Ice Age landscape of forty thousand years ago, the only signs of life on a cold, late-autumn day. Dense morning mist swirls gently over the slow-moving water, stirring fitfully in an icy breeze. Pine trees crowd the riverbank, close to a large clearing where aurochs and bison paw through the snow for fodder. The fur-clad Cro-Magnon family moves slowly— a hunter with a handful of spears, his wife carrying a leather bag of dried meat, a son and a daughter. The five-year-old boy dashes to and fro brandishing a small spear. His older sister stays by her mother, also carrying a skin bag. A sudden gust lifts the clinging gloom on the far side of the stream. Suddenly, the boy shouts and points, then runs in terror to his mother. The children burst into tears and cling to her. A weathered, hirsute face with heavy brows stares out quietly from the undergrowth on the other bank. Expressionless, yet watchful, its Neanderthal owner stands motionless, seemingly oblivious to the cold. The father looks across, waves his spear, and shrugs. The face vanishes as silently as it appeared.

As light snow falls, the family resumes its journey, the father always watchful, eyes never still. During the climb to the rock shelter, he tells his children about their elusive, quiet neighbors, rarely seen and almost never encountered face-to-face. There were more of them in his father's and grandfather's day, when he saw them for the first time. Now sightings are unusual, especially in the cold months. They are people different from us, he explains. They do not speak like we do; we cannot understand them, but they never do us any harm. We just ignore them . . .

Cro-Magnons and Neanderthals: this most classic of historical confrontations, sometimes couched in terms of brutish savagery versus human sophistication, has fascinated archaeologists for generations. On the one side stand primordial humans, endowed with great strength and courage, possessed of the simplest of clothing and weaponry. We speculate that they were incapable of fully articulate speech and had relatively limited intellectual powers. On the other are the Cro-Magnons, the first anatomically modern Europeans, with fully modern brains and linguistic abilities, a penchant for innovation, and all the impressive cognitive skills of *Homo sapiens*. They harvested game large and small effortlessly with highly efficient weapons and enjoyed a complex, refined relationship with their environment, their prey, and the forces of the supernatural world. We know that the confrontation ended with the extinction of the Neanderthals, perhaps about thirty thousand years ago. But how it unfolded remains one of the most challenging and intriguing of all Ice Age mysteries.

The Neanderthals appeared on the academic stage with the discovery of the browridged skull of what seemed to be a primitive human in Germany's Neander Valley in 1856. Seven years later, Thomas Henry Huxley's brilliant study of the cranium in his *Man's Place in Nature* compared the Neanderthal fossil with the skulls of humankind's primate relatives, chimpanzees and gorillas. The thought of a human ancestry among the apes horrified many Victorians. Public opinion carved out a vast chasm between archaic humanity, epitomized by the Neander Valley skull, and the

modern humans discovered in the Cro-Magnon rock shelter at Les Eyzies, in southwestern France, in 1868. The Neanderthals became primitive cave people armed with clubs, dragging their mates around by their long hair. Unfortunately, the stereotype persists to this day.

Cutting-edge science paints a very different portrait of the Neanderthals. They were strong, agile people who thrived in a harsh, often extremely cold Europe, from the shores of the Atlantic deep into Eurasia, from the edges of the steppe to warmer, drier environments in the Near East. Neanderthal hunters stalked large, dangerous animals like bison, then killed them with heavy thrusting spears. They didn't have the luxury of standing off at a distance and launching light spears at their prey. But, for all their strength and skill, they were no matches for the Cro-Magnon newcomers, who, science tells us, spread rapidly across Europe around forty-five thousand years ago. Their hunting territories were small; they were thin on the ground; the routine of their lives changed infinitesimally from one year to the next.

When they arrived in their new homeland, the Cro-Magnons were *us*, members of a species with a completely unprecedented relationship with the world around them. Every Cro-Magnon family, every band, was drenched in symbolism, expressed in numerous ways. Well before thirty thousand years ago, Cro-Magnons were creating engravings and paintings on the walls of caves and rock shelters. They crafted subtle and beautiful carvings on bone and antler and kept records by incising intricate notations on bone plaques. We know that they used bone flutes at least thirty-five thousand years ago, and if they did this, they surely sang and danced in deep caves by firelight on winter evenings and at summer gatherings. Cro-Magnons ornamented their bodies and buried their dead with elaborate grave goods for use in an afterlife. No one doubts that Cro-Magnon symbolic expression somehow reflects their notion of their place in the natural world. But their perceived relationship to nature was poles apart from our own—they were hunter-gatherers and lived in a world that was unimaginably different from today's Europe. And their perceptions of the world, of existence, were radically different from, and infinitely more sophisticated than, those of the Neanderthals.

Cro-Magnon briefly explores the ancestry of the Neanderthals and the world in which they lived, then tries to answer the question of questions: What did happen when Cro-Magnon confronted Neanderthal? Did the moderns slaughter the primordial humans on sight, or did they simply annex prime hunting territories and push their ancient occupants onto marginal lands, where they slowly perished? Or did the superior mental abilities, hunting weapons, and other artifacts of the Cro-Magnons give them the decisive advantage in an increasingly cold late Ice Age world? Do we know what kinds of contacts took place between Neanderthal and newcomer? Did the two populations intermarry occasionally, trade with one another, even borrow hunting methods, technologies, and ideas from each other?

The answers to these questions revolve as much around the Cro-Magnons as they do the Neanderthals. Despite a century and a half of increasingly sophisticated research, the first modern inhabitants of Europe remain a shadowy presence, defined more by their remarkable art traditions and thousands of stone artifacts than by the nature of their lives as hunters and foragers, defined by the Ice Age world in which they flourished. *Cro-Magnon* paints a portrait of these remarkable people fashioned on a far

wider canvas than that of artifacts and cave paintings.

I DECIDED to write this book in the galleries of the National Museum of Prehistory in Les Eyzies, the small village in France's Vézère Valley that prides itself on being the "capital of prehistory." The upper gallery is a quiet place nestled against the great cliff that houses the huge Cro-Magnon rock shelters that once flourished nearby. I gazed at the rows of flint, bone, and antler tools against one long wall, neatly laid out in series, each with its correct archaeological labels and subdivisions. The history of the Neanderthals and Cro-Magnons unfolded like an orderly ladder of artifacts, ever smaller, ever more refined over time. I stared, confused, despite having had formal training in these very tool kits many years ago. Minute variations in one scraper form compared with another; small chisels with different working edges; antler and bone points that once armed lethal spears: the display seemed endless. After a few minutes, I realized that the casual viewer would learn almost nothing about the anonymous makers of these museum-perfect objects beyond the fact that they were able to make artifacts of all kinds. Many questions remained unanswered. Who were the Cro-Magnons? Where did they come from? How did they survive the dramatic changes of the late Ice Age climate tens of thousands of years ago? And how did they behave toward the beetle-browed Neanderthals who were living along the Vézère River when they arrived? The museum displays commemorated a past peopled not by human beings but by artifacts. For all intents and purposes, a rich and vibrant history of some of our remote forebears was dead to all but a small handful of specialists.

Everyone has heard of the artistic glories of Lascaux and Altamira, Font-de-Gaume, and Grotte de Chauvet. Books on Cro-Magnon art of all kinds abound, many of them illustrated with magnificent color pictures of carved antlers, woolly rhinoceroses, aurochs, and Ice Age bison. The authors write of gifted artists, speculate about the motives for the engravings and paintings, sometimes imagine shamans with supernatural powers conducting ceremonies far from daylight. Beyond this, if the people of the period are mentioned at all, it is as big-game hunters pitting themselves against a formidable bestiary. Few of these volumes explore the most fascinating questions about the first modern Europeans—the complex dynamics of their societies, the ancient rhythms of their annual round. And few of them examine the most fundamental questions of ancestry and cognitive skills. Art defines the Cro-Magnons in the public eye when, in fact, it was an integral part of a much larger existence.

Cro-Magnon is a story of hunters and gatherers who lived a unique adventure, whose earliest ancestors almost became extinct in the face of a huge natural catastrophe over seventy thousand years ago. It is a tale of ordinary men and women going about the business of survival in unpredictable, often bitterly cold environments that required them to adapt constantly and opportunistically to short- and long-term climate changes. These people were like us in so many ways: they had the same powerful intelligence and imagination, the ability to innovate and improvise that is common to everyone now living on earth. But they dwelled in a very different world from ours, one where premodern people still lived the same way they had hunted and gathered for hundreds of thousands of years. The history of the Cro-Magnons is the story of a great journey that began over fifty thousand years ago in tropical Africa and

continued after the end of the Ice Age some fifteen thousand years ago. Above all, it's a story of endless ingenuity and adaptability.

WHEN I WAS researching *Cro-Magnon*, I walked along the bank of the Vézère near Les Eyzies on a gray summer's day. The great cliffs with their rock shelters loomed high above, lapped by the deep green of meadow and thick woodland. The river itself ran brown and swift, swelled by the heavy rain of recent weeks. I imagined the same landscape eighteen thousand years ago—much of it treeless, covered with stunted grass and shrubs, a world alive not with bustling humans and their automobiles but with browsing reindeer and red deer with great horns, with chunky wild horses in small herds. There would have been black aurochs with lyre-shaped horns, perhaps arctic foxes in their brown summer fur feeding off a kill, perhaps a pride of lions resting under the trees. If you'd been patient enough, you'd have seen the occasional humans, too. But you would have known they weren't far away—informed by the smell of burning wood, trails of white smoke from rock-shelter hearths, the cries of children at play. Then I imagined this world changing rapidly, soon becoming one of forest and water meadow, devoid of reindeer and wild horses, much of the game lurking in the trees. I marveled at the ability of our forebears to adapt so readily to such dramatic environmental changes.

Few humans have ever lived in a world of such extreme climatic and environmental change. Years ago, I sailed a small yacht through the narrow channels of the Danish archipelago. The deeper water passages twisted and turned, marked by tall poles, nothing else. A gentle breeze from astern carried us through the sinuous defiles at little more than walking speed, which was just as well, as we grounded in the mud several times. I thought of Stone Age hunters fishing and fowling among the nearby reeds; some of them perhaps once camped on the then-dry ground now beneath our keel, in the midst of a dynamic landscape now buried by higher sea levels that changed from one month to the next. These were people without metals, with the simplest of canoes, and with fishing gear and weaponry created from the few suitable materials close to hand. The adaptability and ingenuity of *Homo sapiens* lay before my eyes and was a comforting thought when I contemplated the huge climatic and environmental challenges that lay ahead in the twenty-first century.

Thanks to multidisciplinary science, we now know a great deal more about late Ice Age climate than we did a generation ago. Much of the raw material for this narrative does indeed come from artifacts and food remains, from abandoned hunting camps and the stratified layers of caves and rock shelters. New generations of rock-art studies not only in western Europe but all over the world have added new perceptions about the meaning of Cro-Magnon art on artifacts and cave walls.

However, compared with even twenty years ago, our knowledge of Europe's first moderns has changed beyond recognition thanks to technology and the now well-known revolution in paleoclimatology—the study of ancient climate. Another revolution, in molecular biology, has added mitochondrial DNA (passed down through the female line) and the Y chromosome (roughly the equivalent in men) to the researcher's armory. We now possess far more nuanced insights into Neanderthal and Cro-Magnon life, especially into the environments in which they lived.

Humans have always lived in unpredictable environments, in a state of flux from year to year. Until recently, we thought of the last glaciation of the Ice Age as a continual deep freeze that locked Europe into a refrigerator-like state for over one hundred thousand years, until about fifteen thousand years ago. Thanks to ice cores, pollen grains, cave stalagmites, and other newly discovered indicators of ancient climate, we now know that the glaciation was far from a monolithic event. Rather, Europe's climate shifted dramatically from one millennium to the next, in a constant seesaw of colder and warmer events that often brought near-modern climatic conditions to some areas. Old models assumed that Scandinavia was buried under huge ice sheets for all of the last glaciation. Now we know that this was the case only during the Last Glacial Maximum, about 21,500 to 18,000 years ago, when much of Europe was a polar desert. Much of the time Europe was far warmer, indeed near temperate. What is fascinating about the world of the Neanderthals and the Cro-Magnons is that we now have just enough climatological information to look behind the scenes, as it were, to examine the undercurrents of climate that caused hunting bands to advance and retreat and that perhaps helped drive some Neanderthal groups into extinction.

Cro-Magnon explores Ice Age societies both historically obscure and well known, not just within the narrow confines of Europe, but on a far wider canvas. The Cro-Magnons may have been Europeans, but they were comparative newcomers who arrived from elsewhere. We cannot understand them without journeying far from the familiar confines of Les Eyzies and the Cro-Magnon rock shelter. Thanks to mitochondrial DNA and Y chromosomes, we know that they were ultimately Africans.

Rather startlingly, we also believe that humanity almost became extinct in the aftermath of a colossal explosion, when Mount Toba, on Sumatra, erupted into space about 73,500 years ago. Connecting the dots between dozens of archaeological sites is one of the exciting challenges facing the archaeologist of the future. Many of them are little more than scatters of stone artifacts, which we have to link to ash falls, to climate records wrested from cave stalagmites, to the fluctuations of the Sahara Desert, and to the harsh realities of a life lived in often arid or cold landscapes. All we have at the moment is a tentative framework, based on frequently inadequate data. But it is enough to allow us to peer at the late Ice Age world not from the outside, but from within, for the fundamental routines of hunting and foraging in arctic and tropical, semiarid environments remain much the same today as they were over twenty thousand years ago. There are only a few options for, say, hunting reindeer with spears, driving rabbits into nets, or trapping arctic foxes. We know of them from historic as well as still-living hunter-gatherer societies, whose basic subsistence activities have changed little over the millennia.

The story of the Neanderthals and the Cro-Magnons tells us much about how our forebears adapted to climatic crisis and sudden environmental change. Like us, they faced an uncertain future, and like us, they relied on uniquely human qualities of adaptiveness, ingenuity, and opportunism to carry them through an uncertain and challenging world. We have much to learn from the remote past described in these pages.

Author's Note

Geographical place names are spelled according to the most common usage. Archaeological sites are spelled as they appear most commonly in the sources I used to write this book. Some obscure locations are omitted from the maps for clarity; interested readers should consult the specialist literature.

The notes tend to emphasize sources with extensive bibliographies to allow you to enter the more specialized literature if you desire. This being a narrative account of the Cro-Magnons, sidebars in each chapter provide further information on technicalities such as radiocarbon dates, specialist controversies, and stone technologies.

All radiocarbon dates have been calibrated using the latest version of what is a constantly revised calibration curve. You can view the calibration curve at <http://www.calpal.de>.

A note on the use of the term *Cro-Magnon*: I use it in a generic sense in these pages, as it is a convenient, easily remembered term. Here it is employed interchangeably with *Homo sapiens*, *modern*, and *anatomically modern human (AMH)*. This is a literary compromise for clarity. Scientific reality is, of course, more complex and is fully explored in the specialist literature. Obviously, the Cro-Magnons themselves had no such equivalent term. From the beginning, they were a patchwork of bands, kin groups, and sometimes larger affiliations whose names have not come down to us. The point is, we gave these people their name, its origin a random moment in an extraordinary history.

Cultural terminology is always a thorny issue, especially with the Cro-Magnons, whose archaeology is dauntingly complex. Neanderthal societies flourished during the Middle Paleolithic and Cro-Magnon societies during the Upper Paleolithic, generic labels meaning Middle and Upper (or Late) Old Stone Age that I have not used in this book, although you will find them in the academic literature. Nor have I used the term *Mesolithic* (Middle Stone Age), which refers to hunter-gatherer societies after about ten thousand years ago. I have tried to keep often-arcane cultural terms to a minimum and, for the purposes of this narrative, have ignored the many subdivisions of the various cultures referred to in these pages. Most of them stem from stratigraphic observations of layers in archaeological sites and from differences in stone tools and other artifacts. While these are of vital importance to specialists, I do not consider most of them essential to this story.

CHAPTER 1

Momentous Encounters

THEY CALL HIM *LÖWENMENSCH*, “the Lion Man.” The ivory figurine stands tall, leaning ever so slightly forward, arms by his sides. His head is a lion’s, mouth slightly open, ears pricked, the mane cascading down the back. But his arms are human, relaxed, marked with six or seven striations (see color plate 1). The feet are slightly apart, a hint of maleness between the legs. The Lion Man stands serene, gazing calmly into the distance, contemplating an infinite landscape, a realm far beyond the confines of the living world. He came into being over thirty-four thousand years ago, carved out of water-soaked mammoth tusk by one of our remote ancestors, a Cro-Magnon.¹

The artist who created the Lion Man was just like us. He laughed and cried, loved and hated, was calculating and sometimes devious. She was a member of a small hunting band, one of a few thousand people living in what is now southern Germany amidst a tapestry of coniferous forests and open tundra. Here, reindeer herds migrated north and south with the seasons. Great mammoths fed by icy streams; flocks of arctic ptarmigan croaked at water’s edge. This was no Ice Age paradise. The Lion Man’s creator lived in a world whose harsh realities included frequent hunger and savage winters. But it was also a realm of the mind’s eye, peopled with vibrant animals and powerful supernatural forces, which formed symbolic partnerships between humans and beasts. *Löwenmensch*, with his leonine head and human limbs, bridged the chasm between the living and supernatural realms, the kingdom of the imagination. His maker drew on the awesome cognitive abilities we ourselves possess. Nimble and tall, the Cro-Magnons were identical anatomically and intellectually to modern humans. We know that their brains had an identical configuration to ours, that they were capable of articulate speech, just as we are.

The ancestors of the anonymous creator of the Lion Man had arrived in their challenging homeland about ten thousand years earlier from warmer and drier environments far to the southeast, in southwestern Asia. A new generation of radiocarbon dates tells us that the Cro-Magnons spread across Europe within a mere five thousand years. People moved constantly, responding to social needs and to intelligence about game, campsites, and water supplies. The distances across Europe from southwestern Asia seem enormous, but within a few generations, Cro-Magnon bands would have covered surprising expanses, especially in sparsely populated, often bitterly cold environments, where climatic conditions were constantly changing, often for a few years at a time, sometimes for several lifetimes, at other times seemingly permanently. It’s easy to imagine population movements that spanned 250 miles (400 kilometers) within a generation or so. And wherever they settled, the Cro-Magnons encountered small bands of Neanderthals, the European indigenes, people with biological and cultural roots hundreds of thousands of years in the remote past.² About fifteen thousand years later, by about thirty thousand years ago, in one of the stunning

developments of history, the Neanderthals were extinct.

These pages tell the story of the Cro-Magnons, beginning with their encounters with the primordial Neanderthals. The complex relationship between Cro-Magnon and Neanderthal has fascinated scholars for generations, as if it were the subject of an epic paleoanthropological novel. How did they perceive one another? Did they interbreed, or did the newcomers slaughter Neanderthals on sight? Were archaic and modern humans close neighbors, or did the Cro-Magnons simply push the indigenes out of their ancient hunting territories into marginal landscapes? Did the vastly superior intellectual abilities of the moderns play a central role in driving the Neanderthals into extinction, or were climate changes and extreme cold the ultimate villains? Reality, as far as we can know it, was far from an epic adventure. This is a story of brief but momentous encounters, of people separated by profound incomprehension and misunderstanding. It is also a tale not of great leaders or powerful warriors, but of ordinary Ice Age people rising to the challenge of surviving in brutal environments. What were the secrets of the Cro-Magnons' brilliant success? Was it their more-advanced technology, their hunting and foraging abilities, or brilliant innovation combined with opportunism? Or did their spiritual beliefs and complex relationship with the supernatural realm play a decisive role? The portrait of the Neanderthals and the Cro-Magnons and their world in these pages comes from cutting-edge multidisciplinary science and a growing knowledge of the dynamics of hunter-gatherer societies in every corner of the world. It's no exaggeration to say that the foundations of today's Europe were forged in the events of the late Ice Age, between about forty-five thousand and twelve thousand years ago.

WE MUST BEGIN by introducing the Cro-Magnons. In today's parlance, they are technically anatomically modern humans (AMHs). But the word *Cro-Magnon* rolls off the tongue much better and is a far more satisfying label for the first Europeans, even if it is technically somewhat incorrect. The name dates back to 1868, when the railroad came to the sleepy village of Les Eyzies, in southwestern France. Workmen clearing land for the new station uncovered a small, totally buried rock shelter and some flint tools and animal bones near a rock prophetically called Cro-Magnon, "great cavity." (I was disappointed on a recent visit to discover that there's nothing to see today except a small overhang behind a row of hotel workers' cottages and a weathered plaque on a rock wall.) A young geologist, Louis Lartet, dug into the back of the shelter soon after its discovery.³ He unearthed five human skeletons, including the remains of a fetus and several adults, among them a woman who may have been killed by a blow to the head. The burials lay among a scatter of shell beads and ivory pendants. These were no Neanderthals with simple artifacts and no bodily decoration. The Cro-Magnon people had round heads and high foreheads and were identical to modern humans.

Les Eyzies lies on the bank of the Vézère River in a valley where high limestone cliffs with caves and deep overhangs provided wonderful shelter for Ice Age visitors. Louis Lartet's father, Édouard, had partnered with Henry Christy, a wealthy English banker, to dig into Les Eyzies' huge rock shelters in the early 1860s. They had uncovered flint artifacts, engraved harpoons, and numerous reindeer bones, but no human remains. The Cro-Magnon find proved that the makers of these artifacts were

Homo sapiens, the remote ancestors of modern Europeans, who lived during the Ice Age, during a period somewhat fancifully called l'Âge du Renne, or the Reindeer Age, because of the numerous bones of these animals found in the rock shelters. Soon scholars were comparing them (wrongly) to the Eskimo of the Arctic, but one fact was beyond question: they were the successors of the Neanderthals. Just where they came from is still the subject of lively academic debate.

The Cro-Magnons, among whom the creator of the Lion Man numbered, were but specks on a vast European landscape of deep river valleys, mountains, and boundless open plains. They were well aware they were not the only humans preying on bison and reindeer, seizing meat from predator kills, stalking wild oxen on the edges of dark green pine forests. Just occasionally, they would glimpse their rivals— a Neanderthal band slipping quietly across a water meadow, people so different that Cro-Magnon children would run away. Like the Neanderthals, the Cro-Magnon newcomers were thin on the ground. But they were completely different. They were *Homo sapiens*, “the wise person,” capable of flexible thinking, planning ahead, and fully articulate speech. Europe was never the same after their arrival.

On long winter nights, the older men, perhaps those with unusual supernatural powers, would tell stories of a time long ago when their exotic neighbors were thicker on the ground. But even then they were a rare presence, glimpsed walking quietly among the trees or high above a valley on a steep hillside. Now there were far fewer of them. Close encounters were an unusual event, perhaps during a hunt, or when collecting honey in the summer. Perhaps two handfuls of men and boys out hunting would face off unexpectedly, spears in hand, watching closely for a threatening gesture. The physical contrast was dramatic: tall, slender Cro-Magnons; compact Neanderthals.⁴ The Cro-Magnons wore close-fitting fur parkas, long pants, and waterproof boots. Their potential adversaries were barefoot men of immense strength, their bodies draped in thick furs crudely joined with thongs. They carried heavy, fire-hardened spears and wooden clubs, nothing more, weaponry virtually identical to that carried by their remote ancestors tens of thousands of years before. Each side would stare at the other. Perhaps a few gestures would ensue, universal to all humans: a smile, a proffered gift of a honeycomb, perhaps some quiet grunts. There was no shared language, perhaps not even a common body odor. After a few moments, Cro-Magnon and Neanderthal would likely go their separate ways. We can only guess at the nature of such encounters. Our only potential analogies come from meetings between Western explorers and hitherto unknown societies, like, for example, the Tasmanian Aborigines, in the late eighteenth century. The Tasmanians had encountered no outsiders since rising sea levels had isolated them from mainland Australia nine thousand years earlier. Both sides recognized the other as fellow humans, but beyond that and some common gestures of friendship like a smile, they lived in entirely different worlds. We can be sure that any brief meetings with Neanderthals would be long remembered by the moderns, who would pass on recollections of such unusual events from one generation to the next. One is reminded of the New Zealand Maori, who still retained vivid memories of Captain James Cook and his ships a century after he departed over the horizon.

CENTRAL EUROPE, FORTY thousand years ago. Thick mist lies low over the stream, obscuring the tops of the dark fir trees. The fast-flowing water ripples loudly in the still air. A reindeer with magnificent antlers grazes quietly by the riverbank, knee-deep in the cold shallows. Two Neanderthal hunters watch silently, crouched in the snow, hidden by large boulders. They have been stalking the reindeer since first light, oblivious to the biting cold, slipping quietly from tree to tree in the dark shadows. Now they are in range, only a few feet from their prey. The older man slowly raises his fire-hardened wooden spear and crouches for a quick leap for the reindeer's vulnerable heart. His prey looks up unexpectedly, alert to a virtually inaudible sound on the far bank. *Phut! Phut!* Moments later, two antler-tipped spears cast from among the trees land on target. The beast staggers and falls into the river. An eddy carries the still-twitching carcass across a deep pool to the other bank.

As the dead reindeer floats out of range, the Neanderthals lower their weapons. Just for a moment, the mist parts. Three men in fur parkas look down at the fitfully moving beast, long spears and spear throwers in hand. As the two younger hunters drag the reindeer from the water, the oldest man shakes loose the hood of his parka, revealing a head of thick red hair above a smooth, well-rounded forehead. He glances dismissively at the skin-clad Neanderthals and raises his spear in contemptuous defiance. Moments later, the strangers vanish into the forest with their prey . . .

The Neanderthals, *Homo neanderthalis*, require no introduction to any reader of popular science. They are the cave people of prehistory, the hirsute folk with wooden clubs, a grossly unfair characterization of skilled, tough hunters armed with little more than wooden thrusting spears, who were not afraid to hunt such formidable beasts as the European bison and the aurochs, *Bos primigenius*, the fierce primordial wild ox. But there is much more to the Neanderthals than cartoonists' stereotypes. Forty-five thousand years ago, perhaps fifteen thousand to twenty thousand of them lived between the Atlantic Ocean in the west and the Ural Mountains, in Eurasia, far to the east. They hunted and foraged in small family bands. Most of them encountered no more than a few dozen fellow humans during their lifetime and then only briefly, perhaps for a cooperative hunt or to obtain a mate. They thrived for thousands of years in some of the most brutal environments of the late Ice Age world, including extremes of cold— when they had Europe to themselves (figure 1.1).

Dates are in approximate calendar years ago, mostly calibrated radiocarbon readings. Mya = million years ago.

10,000	Increasingly diverse hunter-gatherer societies throughout Europe.
11,000	Magdalenian culture ends.
c.12,000	Agriculture and animal domestication in the Near East.
13,000	Niaux paintings.
14,800	Altamira paintings and engravings.
17,000	Magdalenian groups expand northward as western Europe warms.
17,000(?)	Lascaux paintings and engravings.
18,000	Magdalenian culture begins.
	Solutrean groups in northern Spain and southwestern France.
21,500/	Last Glacial Maximum.
18,000	
25,000	Heyday of the Gravettian culture, which persists in various forms in much of eastern Europe until the end of the last glaciation.
30,000(?)	Neanderthals become extinct.
29,000	Aurignacian culture ends.
32,000?	Grotte de Chauvet paintings—date range uncertain.
39,000	Aurignacian culture appears over much of Europe.
	Campanian eruption in Italy.
42,500(?)	Cro-Magnons appear in western Europe.
45,000	Modern humans at Kostenki in eastern Europe, having spread north from the Near East.
c.55,000	Fully modern humans spread out of Africa. Exact date is uncertain.
70,000	End of megadroughts in Africa.
	First Last Glacial Maximum in Europe.
73,500	Mount Toba eruption decimates humanity.
	Modern humans become extinct in the Near East (?).
100,000(?)	Some <i>Homo sapiens</i> groups settle in the Near East from Africa.
128,000/	Last Interglacial.
115,000	
160,000	Herto <i>Homo sapiens</i> fossils, Ethiopia.
171,500	Genetic estimate of the appearance of the first modern humans.
195,000	Omo Kibish <i>Homo sapiens</i> fossil, Ethiopia.
200,000	Neanderthals well established in Europe.
400,000	Atapuerca <i>Homo heidelbergensis</i> . Possibly ancestral Neanderthals.
500,000	Mauer <i>Homo heidelbergensis</i> , Germany.
600,000	<i>Homo heidelbergensis</i> evolves in Africa (?).
1.1 mya	Human settlement at Sima del Elefante, Atapuerca, Spain.
1.6 mya	Dmanisi fossils, Georgia.
1.8 mya	<i>Homo ergaster</i> moves out of Africa (?).
2 mya	<i>Homo ergaster</i> evolves out of earlier <i>Homo</i> .

Figure 1.1 Major developments and events covered in this book.

Where did they come from? What we know of their early history has been gleaned from meager scatters of stone tools and a few human fossils. These tell us that Neanderthal ancestry goes back far into remote prehistory, described in chapter 2. The earliest definite Neanderthals date to about 200,000 years ago. We also know, from an increasing number of archaeological sites, that their numbers rose slowly after about 150,000 years ago, following a period of intense cold that lasted at least 30,000 years. They flourished, albeit in smallish numbers, through subsequent, more temperate millennia. In what is now Italy, they hunted elephant and hippopotamus about 125,000 years ago. The warmer conditions lasted until about 115,000 years before the present, when the last glacial period of the Ice Age brought much colder temperatures and major environmental changes. By then, Neanderthals thrived in small numbers over an enormous area of Europe and Asia, from southern Britain and the Atlantic, through Belgium and France, across central Europe, and deep into central Asia, far east of the Black Sea into modern-day Uzbekistan and perhaps beyond. Neanderthal bands flourished in warmer environments, too, in the Near East in Greece, and in Spain as far south as Gibraltar (see figure 3.2).

For all their wide distribution, the small populations of the Neanderthals were a fleeting presence in grand Ice Age landscapes. They were the only human beings in a dangerous, predator-rich world, where survival depended on careful observation, constant watchfulness, and opportunism. Theirs was a rhythm of life that shifted

infinitesimally over tens of thousands of years until the Cro-Magnons invaded ancient Neanderthal hunting territories and disturbed the even tenor of their days.

SUCH, THEN, ARE the protagonists of our story, the indigenes and the newcomers. Édouard Lartet and Henry Christy established that the Cro-Magnons were the successors of the Neanderthals. But where had the Cro-Magnons come from? Had they originated in Europe itself, as many early Eurocentric scholars assumed? Or had they come from elsewhere? Experts pointed to the densely packed layers of rock shelters and caves in the Vézère Valley and northern Spain, to the seemingly orderly transition of artifacts from one stratified layer to another over thousands of years, starting with Neanderthal occupation and ending up at the end of the Ice Age. However, as archaeological research expanded into regions like the Danube Valley and the Near East before World War II, it became apparent from different artifact sequences that the Cro-Magnons were outsiders who had originated far from western Europe.

If ever there was an archaeological will-o'-the-wisp, the search for the first modern humans is one. The quest has shifted from the relatively familiar caves and rock shelters of the Near East, until recently the favorite candidate for place of origin, into the depths of tropical Africa. I worked in southern Africa early in my career, in the 1960s, and had a chance to examine many archaeological collections in the museum in Cape Town and elsewhere. The artifacts were nothing spectacular, mostly trimmed flakes struck off from stone nodules, scraping tools, occasional stone projectile points, and, from later caves and shell heaps, enormous quantities of small stone arrow barbs and numerous bone tools. There were few radiocarbon dates; most of the excavations dated to the 1930s. When I was there, only a handful of excavations existed between Sudan and the Cape of Good Hope, but the numbers have increased dramatically since the 1970s. New digs have transformed our knowledge of Africa over one hundred thousand years ago. We now know that *Homo sapiens* flourished in tropical Africa long before modern people colonized Europe or the Near East.

The first strong clues came during the 1980s, when some fragments of modern humans came from a one-hundred-thousand-to eighty-thousand-year-old occupation level in one of the Klasies River caves, on the southeast African coast. These were the earliest *Homo sapiens* finds in the world at the time, and I, among others, had trouble accepting the chronology. At this point, molecular biologists studying mitochondrial DNA (mtDNA), which is inherited through the female line, threw an intellectual cat among the proverbial pigeons. A group of geneticists headed by Rebecca Cann and Alan Wilson, using mtDNA and a sophisticated “molecular clock,” traced modern-human ancestry back to isolated African populations dating to between two hundred thousand and one hundred thousand years ago. Inevitably there was talk of an “African Eve,” a first modern woman, the hypothetical ancestor of all modern humankind. Most archaeologists gulped and took a deep breath. Cann and her colleagues had taken *Homo sapiens* into new and uncharted historical territory.⁵

Furious controversy surrounded the African Eve, pitting biological anthropologists who believed that all modern humanity had originated in Africa against those who argued for multiple origins in different parts of the Old World. As we will see in

chapter 5, molecular biology is now much more refined, and the mtDNA, and now Y chromosome, samples are larger. The Genetic case for an African origin for *Homo sapiens* seems overwhelming. The archaeologists have also stepped forward with new fossil discoveries, including a robust 195,000-year-old modern human from Omo Kibish, in Ethiopia, and three 160,000-year-old *Homo sapiens* skulls from Herto, also in Ethiopia. Few anthropologists now doubt that Africa was the cradle of *Homo sapiens* and home to the remotest ancestors of the first modern Europeans—the Cro-Magnons. The seemingly outrageous chronology of two decades ago is now accepted as historical reality.

If *Homo sapiens* indeed originated in tropical Africa, how and when did the descendants of whom we can, somewhat indulgently, call the African Eve move into the semiarid lands of the Near East? Here we embark into the realm of speculation, largely because small bands of hunter-gatherers leave few traces of their passing behind them. We're back with the archaeological will-o'-the-wisp, forced to rely on general clues. We can be pretty certain the migrants were people adapted to open country, who were constantly on the move. Their tools and weaponry had to be carried everywhere, so it is hardly surprising that little survives except for occasional groupings of stone tools.

A generation ago, we thought of a single, albeit complex, movement out of Africa, perhaps about one hundred thousand years ago. This relatively simple model has given way to a more complex scenario involving two out-migrations. The first may indeed have occurred about one hundred thousand years ago but seems to have fizzled in the Near East, perhaps in the face of drought. A second, even less well-documented push seems to have taken place later, around fifty thousand years ago. This time, moderns settled throughout Near East Asia and stayed there, apparently living alongside a sparse Neanderthal population. This widely accepted theory assumes that by this time the newcomers had all the intellectual capabilities of *Homo sapiens*. Just when and how they acquired them remains a major unsolved problem. All we can say is that at some point between one hundred thousand and fifty thousand years ago, at a seminal yet still little known moment in history, *Homo sapiens* developed the full battery of cognitive skills that we ourselves possess. After a surprisingly short time, perhaps a mere five thousand years, their descendants moved northward into Eurasia and Europe.

Like most archaeologists, I have a profound distrust of theoretical scenarios without the sites and artifacts to back them up, but in the case of modern-human origins, we have to work with such tools in the absence of much hard data. As we shall see in chapter 5, the two out-migrations theory seems the most convincing working model for bringing the ancestors of the Cro-Magnons into their new homeland. Refinements, indeed wholesale changes, are likely to descend on this model in future years, but one fundamental point is of great importance: in the final analysis, the first modern settlers of Eurasia and Europe were ultimately Africans. Many of their hunting practices, light weapons, and social institutions developed in semiarid lands south of the Sahara Desert in the tropics. I believe this ancestry had a profound influence on the ways they adapted their lives to a much colder world of climatic extremes.

THE ENCOUNTERS BETWEEN Neanderthals and Cro-Magnons in Europe and Eurasia were an intricate social gavotte that played out over many centuries. There was nothing new about the dance, for the newcomers had met Neanderthals many times before. Their ancestors had lived alongside Neanderthals in the semiarid lands of southwest Asia. You can be sure that oral traditions of their dealings with what to them must have been somewhat alien beings passed down through the generations. The Neanderthals were exotic because they lacked a common tongue, if, indeed, they possessed fluent speech at all. By the time the first Cro-Magnons arrived in Europe, a huge intellectual and social chasm separated them from their neighbors. We will, of course, never know what they thought of the Neanderthals. They may have respected their great strength and their stalking abilities, but I suspect the Cro-Magnons thought of the Neanderthals not as humans like themselves, but as something that resembled them but acted, smelled, and spoke entirely differently. Each may well have avoided the other, for they had nothing in common. Their encounters were likely mostly momentary contacts in sheltered river valleys and on open plains, by lakes and on seacoasts, by rock shelters and in caves. Archaic and modern lived alongside one another, probably at a distance, until the last Neanderthals died out, probably in Spain, some thirty thousand years ago; the date is controversial.

A huge academic literature surrounds the Neanderthals and their fateful encounters with the aggressive and opportunistic newcomers. Theories abound, as do questions, most of them virtually impossible to answer. Did modern humans attack their new neighbors and rapidly drive them out of their favorite hunting territories into marginal environments? To prove this would require dozens of regional maps with site distributions of numerous accurately dated Neanderthal and Cro-Magnon sites. Unfortunately, we don't have the sites, let alone a way of dating them accurately to within the span of a few generations, which is the kind of precision one would need. Take another scenario. Did Cro-Magnon bands kill off Neanderthals whenever they encountered them? Once again, the proof is near impossible to acquire. You would need to find human skeletons with spear points embedded in them— not just a single burial but dozens of them in different locations. So far, we have none. Then there's sex, a thorny subject that provokes news headlines without fail. Did Neanderthals and Cro-Magnons interbreed? Some years ago, the geneticists Svante Pääbo and Matthias Krings of the University of Munich succeeded in extracting a partial DNA sequence from a Neanderthal limb bone. Recently, Pääbo and his colleagues decoded most of the Neanderthal's mtDNA.⁶ They found that the Neanderthal sequence falls outside the range of Genetic variation in modern humans, which means they were not direct ancestors of *Homo sapiens*. Humans and chimpanzees share over 98 percent of their DNA sequence. Neanderthals were even closer to moderns, but the small differences are enough to show that we began to diverge from them around seven hundred thousand years ago. Could Cro-Magnons and Neanderthals then have interbred? Most experts think they did not.

There remains the most popular theory: modern humans were simply more adept at hunting and survival in very challenging, ever-changing late Ice Age environments. You can point to the Cro-Magnons' superior weapons and more efficient technology, to their clothing, and, above all, to their enhanced cognitive abilities. All of these must have been players in the ongoing gavotte, but to invoke a single, overriding cause for

the Neanderthals' demise is to court accusations of oversimplification. Here, however, we can make a stronger case, based on both archaeological finds and intelligent speculation.

Both Neanderthals and Cro-Magnons coped effortlessly with abrupt climatic changes from near-temperate to extremely frigid conditions. How well, however, the Neanderthals were able to deal with deep snow cover and long months of subzero temperatures is a matter of ongoing debate. They lacked what was, perhaps, one of the most revolutionary inventions in history, and an inconspicuous one at that: the eyed needle, fashioned from a sliver of antler, bone, or ivory. If their expertise with antler is any guide, the Cro-Magnons must have been adept woodworkers in the more temperate environments of southwestern Asia. When they moved north, they settled on a continent where antler and bone were potential replacements for wood, and where mammoth and other large animal bones had to be used as fuel in more treeless environments. With brilliant opportunism, they used small stone chisels to remove fine splinters from antler and bone, which they then ground and polished into slender needles. Carefully fashioned stone awls served as drills to make the holes for the thongs that served as thread, substitutes for the vegetable fibers used with wooden needles in their ancestral homes.

Every Cro-Magnon, man, woman, and child, must have been aware that protection from clothing came in layers, that warmth escaped from the head and extremities. As we will see, an indirect source of information on the garments they wore is the traditional clothing used by Eskimo and Inuit in very cold environments—the argument being that there are only a limited number of ways in which layered, cold-weather clothing can be fashioned from hides and skins. The needle allowed women to tailor garments from the fur and skin of different animals, such as wolves, reindeer, and arctic foxes, taking full advantage of each hide or pelt's unique qualities to reduce the dangers of frostbite and hypothermia in environments of rapidly changing extremes.⁷ We cannot overestimate the importance of tailored clothing in Cro-Magnon life, especially when stacked up against draped skins.

Cro-Magnon hunters also relied heavily on more lethal, lighter-weight stone-tipped spears with greater range, more effective weaponry than the fire-hardened weapons of their neighbors. In the long run, two innovations, layered clothing and more effective projectiles, gave the Cro-Magnons a decisive practical advantage over the Neanderthals. The one enabled them to hunt efficiently in extremely cold, changeable conditions. The other allowed them to harvest a wider range of animals, especially medium-and smaller-sized beasts, which provided not only meat but also furs and other vital commodities for survival. They also used ingenious devices for procuring small mammals, birds (including waterfowl in the late spring and summer), and eventually fish: nets, traps, light throwing darts, and so forth. Cro-Magnon technological imagination opened up for them a whole new ecological niche that had been beyond the reach of their predecessors.

Was there another decisive advantage? The answer is probably an emphatic yes. What gave the newcomers the real edge was their intellectual awareness and imagination, their ability not only to cooperate with others, as the Neanderthals did, but also to plan ahead and to think of their surroundings as a living, vibrant world. This they defined with art and ritual, ceremony, chant, and dance, which helped them