Neanderthals all lived in much the same fashion, their replacements began to show great local variation in their stone technologies and their styles of art. It seems to represent the beginning of Ricardo's comparative advantage.[11]

Even if I am wrong, even if trade between groups came much later, at the brink of recorded history, its invention represents one of the very few moments in evolution when *Homo sapiens* stumbled on some competitive ecological advantage over other species that was truly unique. There simply is no other animal that exploits the law of comparative advantage between groups. Within groups, as we have seen, the division of labour is beautifully exploited by the ants, the mole rats, the Huia birds. But not between groups.

David Ricardo explained a trick that our ancestors had invented many, many years before. The law of comparative advantage is one of the ecological aces that our species holds.

CHAPTER ELEVEN

Ecology as Religion

In which living in harmony with nature proves harder than expected

The good shepherd giveth his life for his sheep. But he that is an hireling, and not the shepherd, whose own the sheep are not, seeth the wolf coming, and leaveth the sheep, and fleeth: and the wolf catcheth them, and scattereth the sheep. The hireling fleeth, because he is an hireling, and careth not for the sheep. The Gospel according to St John 10.11–13

Chief Seattle, leader of the Duwamish Indians, delivered a famous speech to the governor of Washington territory in 1854. The governor had offered to buy the chief's land on behalf of Franklin Pierce, president of the United States. Seattle replied in a long and shaming speech that is now among the most widely quoted texts in all environmental literature. It presages almost every thread in the philosophy of the modern conservation movement. The speech exists in various slightly different versions, one of the most moving being that which Albert Gore quoted in his book *Earth in the Balance*:

How can you buy or sell the sky? The land? The idea is strange to us . . . Every part of this earth is sacred to my people. Every shining pine needle, every sandy shore, every mist in the dark woods, every meadow, every humming insect. All are holy in the memory and experience of my people . . . Will you teach your children what we have taught our children? That the earth is our mother? What befalls the earth befalls all the sons of earth. This we know: the earth does not belong to man, man belongs to the earth. All things are connected like the blood that unites us all. Man does not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself.[1]

To Gore this shows 'the rich tapestry of ideas about our relationship to the earth' contained in native American religions. For Gore, as for so many people today, respect for the earth is not just good sense, but a sort of moral virtue. To question it is to sin: 'We each need to assess our own relationship to the natural world and renew, at the deepest level of personal integrity, a connection to it . . . The

place to start is with faith, which for me is akin to a kind of spiritual gyroscope that spins in its own circumference in a stabilizing harmony with what is inside and what is out,' he preaches.[2]

He is in good company. Listen to some prominent advocates of spiritual ecology. 'Building an environmentally sustainable future depends on restructuring the global economy, major shifts in human reproductive behavior, and dramatic changes in values and lifestyles,' says Lester Brown, a leading American environmentalist. 'I very much doubt that we can heal the human spirit without discovering and learning to live by a new sense of purpose appropriate to the age and the ecological challenges we now face,' writes Jonathon Porritt, an equally prominent British environmentalist. 'Modern society will find no solution to the ecological problem unless it takes a serious look at its lifestyle . . . The seriousness of the ecological issue lays bare the depth of man's moral crisis,' opines the Pope. 'It is my own personal belief that we need to combine technological ability with, for want of a better description, spiritual readjustment and a realisation that certain truths are eternal,' urges the Prince of Wales.[3]

These are not modest aims. They are calls to change human nature. If such eco-optimism is well founded, then the argument of this book falls, and people are not calculating machines intricately designed to find cooperative strategies only when they assist enlightened self-interest. So if Chief Seattle really did live by his own philosophy of universal brotherhood with nature, I have a big explaining job to do. Ecologically noble savages – to borrow Rousseau's term – are inconsistent with the picture I have painted.

The chief's prescience, alas, is illusory. Nobody knows what he said that day. The only report, made thirty years later, was that he praised the generosity of the great white chief in buying his land. The entire 'speech' is a work of modern fiction. It was written for an ABC television drama by a screenwriter and professor of film, Ted Perry, in 1971. Though many environmentalists, Gore included, like to pretend otherwise, Chief Seattle was no tree-hugger. Among the few things we do know about him are that he was a slave owner and had killed almost all his enemies. As the case of Chief Seattle illustrates, the entire notion of living in harmony with nature is built on wishful thinking.[4]

Preaching and practice

Unless forcibly reminded of nature's cruelty, people tend to romanticize wildlife, seeing benevolence and overlooking viciousness. As George Williams has emphasized, crimes at least equivalent in their effects (if not their motives) to murder, rape, cannibalism, infanticide, deception, theft, torture and genocide are not just committed by animals, but are almost ways of life. Ground squirrels routinely eat baby ground squirrels; mallard drakes routinely drown ducks during gang rape; parasitic wasps routinely eat their victims alive from the inside; chimpanzees – our nearest relatives – routinely pursue gang warfare. Yet, as supposedly objective television programmes about nature repeatedly demonstrate, human beings just do not want to know these facts. They bowdlerize nature, desperately play up the slimmest of clues to animal virtue (dolphins saving drowning people, elephants mourning their dead), and clutch at straws suggesting that humankind somehow caused aberrant cruelty. When dolphins were recently found to be attacking porpoises off Scotland, animal 'experts' attributed this 'aberrant behaviour' to pollution of some kind, an assertion for which they admitted they had no evidence of any kind. We eliminate the negative and sentimentalize the positive.

We treat aboriginal people with the same condescending sentimentalism, as the enduring myth of the noble savage shows. But whereas in Rousseau's day the myth concerned social virtues, today it takes an ecological form. On an ethical level, respect for the sustainable use of the planet's resources has become one of the defining marks of a moral person. To express environmental sentiments is as politically correct today as to express any other bias in favour of the greater good: respect for minorities, distaste for crime and greed, belief in people's innate goodness, adherence to the golden rule. It is as disgraceful to be in favour of pollution these days as it was to be in favour of Satan in the thirteenth century. If, as I have argued in the

preceding chapters, the human race is addicted to moralizing (though not necessarily acting) in favour of the greater good, for evolutionarily sound reasons, then it is no surprise that we seize upon political issues to express this instinct whenever we can. One of the most powerful ways to do so is to express the conservation ethic, to lament the fate of whales and rain forests, to disapprove of development, industry and growth – and to paint a rosy picture of how our ancestors (and our more tribal contemporaries) were morally better in this regard than we are.

This is, of course, hypocrisy. Just as we wish other people to turn the other cheek when hurt, but seek revenge on behalf of close relatives and friends, just as we urge morality far more than we act it, so environmentalism is something we prefer to preach than to practise. Everybody, it seems, wants a new road for themselves, but less road-building. Everybody wants another car, but wishes there were fewer on the road. Everybody wants two kids, but lower population growth.

The idea that native Americans had an environmental ethic that prevented their over-exploitation of nature is a recent invention of Westerners. When Daniel Day Lewis's screen father, Chingachgook, says to a deer his son has just killed, in the opening scene of the film *Last of the Mohicans*, 'We're sorry to kill you, brother. We do homage to your courage, speed and strength', he was being anachronistic. There is no evidence that the 'thank-you-dead-animal' ritual was a part of Indian folklore before the twentieth century. Even if it was a common practice, the animal was no less dead, however much the killer apologized.

The conventional wisdom holds that Indians were at one with nature, respecting and forbearing towards it, magically attuned to it and resolute in practising careful management so as not to damage the stock of their game. Archaeological sites throw doubt upon these comforting myths. Whereas wolves mostly kill old and very young animals, the elk killed by Indians were mostly in their prime. Cows were far more often killed than bulls, and very few elk lived to the same age that they do today. There is, concludes the ecologist Charles Kay, no evidence that native North Americans conserved big game.

Indeed, based on a comparison of the vegetation now and in the past, he argues that Indians were on the brink of driving the elk extinct in large parts of the Rockies before Columbus landed. While this extreme conclusion is disputed, certainly we know that throughout North America white men found game surprisingly scarce except on land disputed by two warring tribes (where the wars interfered with hunting). If there were spiritual and religious injunctions to conserve, they were remarkably ineffective. Indeed, Kay goes on to suggest, religious and shamanistic rituals may even have made things worse:

> Since native Americans saw no connection between their hunting and game numbers, the system of religious beliefs actually fostered the overexploitation of ungulate populations. Religious respect for animals does not equal conservation.[5]

Yet the myth persists, often for the explicit reason that preaching is seen as more important than practice. Even if it is not true of Amazon Indians, says one defender of Indian rights, that they conserve nature, it should continue to be said that they do, because 'any evidence of ecologically unsound activities by indigenous and traditional peoples undermines their basic rights to land, resources, and cultural practice'.[6]

The great Stone Age extinctions

The devastation wrought by our indigenous and traditional ancestors as they extinguished their way across the planet during and after the last ice age is only now becoming clear. Coincident with the first certain arrival of people in North America, 11,500 years ago, seventy-three per cent of the large mammal genera quickly died out. Gone were giant bison, wild horse, short-faced bear, mammoth, mastodon, sabre-toothed cat, giant ground sloth and wild camel. By 8,000 years ago, eighty per cent of the large mammal genera in South America were also extinct – giant sloths, giant armadillos, giant guanacos, giant capybaras, anteaters the size of horses.

This is known as the Pleistocene overkill. Sentimentalists among us still try to insist that it was a changing climate, not mankind, that did the damage, or that we only delivered the *coup de grâce* to species that were already in decline. It is remarkable how strong remains the wishful thinking for finding an excuse to believe in climatic change. But the sheer coincidence of the extinctions with the arrival of the first people, together with the fact that climate had often changed before as ice ages began and ended, and the strange selectivity of the extinguishing force – always killing the bigger animals – indict our species. There is also direct evidence: butchered carcasses with the spearheads of the Clovis people embedded in the bones. It is true that Africa and Eurasia saw no such sudden bursts of extinction of large mammals, and that mammoth hunting persisted for 20,000 years in Eurasia – but the mammoths and woolly rhinos went just as extinct there in the end as they did in North America. Besides, having lived with the human predator for millions of years already, the African and Eurasian fauna had already adjusted. The more vulnerable species had probably already died out, and the survivors had learnt to give us a wide berth, or to migrate in large herds. It is noticeable that the large North American mammals that did not go extinct in the Pleistocene overkill were mostly the ones that had crossed the land bridge from Asia together with people: the moose, elk, caribou, musk ox and brown bear. 'Did the animals simply fade away, or did we kill them?' asks Colin Tudge in *The Day Before Yesterday*; he answers his own question: 'Of course we killed them.'[7]

In other parts of the world, where people arrived suddenly and recently, the ecological effects of them were devastating – irrespective of climate. The guilt of the human species is not in doubt. Take Madagascar, where at least seventeen species of lemurs (all the diurnal ones larger than ten kilograms in weight; one as big as a gorilla), and the remarkable elephant birds – the biggest of which weighed 1,000 pounds – were dead within a few centuries of the island's first colonization by people in about 500 AD. It was a process repeated throughout the Pacific by the Polynesians and most spectacularly of all just six hundred years ago on New Zealand, where the first

Maoris sat down and ate their way through all twelve species of the giant moa birds (the biggest weighing a quarter of a ton) before turning cannibal in desperation. At one moa butchering site near Otago at least 30,000 were killed in a short time – and on average a third of the meat was left to rot, only the best haunches being taken. Entire ovens, with the roast haunches still in them, were left unopened, so abundant was the supply of meat. It was not just moas. Half of all New Zealand's indigenous land birds are extinct.

On Hawaii, we now know that there were about 100 species of unique Hawaiian birds, many of them large and flightless. Then, about 300 AD, a large mammal called humankind arrived. Within a short time no fewer than half of the Hawaiian birds were extinct. When this was first realized, after the excavation of an archaeological site in 1982, it was considered by native Hawaiians a major embarrassment for they had been arguing for many years that it was the arrival of Captain Cook that had upset a harmonious relationship between people and nature in the islands. In all, as the Polynesians colonized the Pacific, they extinguished twenty per cent of all the bird species on Earth.[8]

It took a little longer to wipe out Australia's large mammals. Yet soon after the arrival of the first people in Australia, possibly 60,000 years ago, a whole guild of large beasts vanished – marsupial rhinos, giant diprotodons, tree fellers, marsupial lions, five kinds of giant wombat, seven kinds of short-faced kangaroos, eight kinds of giant kangaroo, a two-hundred-kilogram flightless bird. Even the kangaroo species that survived shrank dramatically in size, a classic evolutionary response to heavy predation (which puts pressure on prey to start breeding when smaller).

It is crucial to remember that the fauna of the Americas, of Australia and of oceanic islands was naïve and unafraid of people. This, if anything, would have made conservation easier if the people had been so minded. Domestication or semi-domestication would have been simple. Consider this description of Lord Howe Island's virgin fauna when the first people reached it. In this case, unusually, the first people were sea-faring Europeans, the Polynesians having failed to find the island.

There was, wrote a member of the ship's party, '. . . A curious brown bird abt. the size of a Landrail in England walking totally fearless & unconcern'd in all part around us, so we had nothing more to do than to stand still a minute or two & knock as many as we pleased wt. a short stick – if you throwed at them and missed them, or even hit them with out killing them, they never made the least attempt to fly away . . . The Pidgeons were also as tame as those already described & wd. sit upon the branches of trees till you might go and take them off with your hand . . .'[9] Imagine a whole continent full of large mammals like that.

Yet our ancestors did not domesticate or manage the tame mammoths of North America or the trusting giant sloths of South America. They butchered them into oblivion. At Olsen-Chubbock, the site of ancient bison massacres in Colorado, where people regularly stampeded herds over a cliff, the animals lay in such heaps after a successful stampede that only the ones on top were butchered, and only the best joints were taken from them. Some conservationists![10]

Like a wolf on the fold

This ecological short-sightedness was not confined to hunters. In many parts of the world, ancient and simple-tooled people had astonishingly large effects on forests. In 1,000 years the Polynesians converted Easter Island, in the eastern Pacific, from a lush forest that provided wood for fishing canoes, food for many land birds and breeding sites for thirty kinds of seabirds, into a treeless, infertile and largely birdless grassland where famine, warfare and cannibalism thrived, and where vast stone statues lay abandoned in their quarries for want of logs to roll them into place. Petra, in Jordan, was once a thriving city in a thickly forested area, until the pressure of people turned it into a desert. The Mayan empire reduced the Yucatan peninsula to scrub and so fatally wounded itself. Chaco Canyon in New Mexico is the site of the largest building in North America before skyscrapers: it contained 650 rooms and 200,000 huge pine

beams. Yet it was abandoned before the Spaniards arrived and its position is baffling. It is in a waterless desert with no pine trees for fifty miles or more. Archaeology has revealed that the Anasazi who built it had to go progressively farther for wood, eventually building a fifty-mile road specially to drag pine logs to the increasingly eroded and desiccated site. Finally they ran out of timber and their civilization fell. The forest has never recovered.[11]

History abounds with evidence that the limitations of technology or demand, rather than a culture of self-restraint, is what has kept tribal people from overexploiting their environment. Nor are the environmental practices of modern indigenous people as pretty a sight as romantic propaganda would have us believe. It is still routinely asserted that tribal people are careful to husband resources, careful to respect limits and careful to practise restraint, mediating these goals through religious and ritual observance. 'In my opinion,' writes Richard Nelson, 'the ethnographic record supports the existence of a widespread and well-developed tradition of conservation, land stewardship, and religiously based environmental ethics among Native Americans . . . we need to rediscover a deep, perhaps spiritually based, affiliation with life.'[12]

Practically every television programme about the tribal inhabitants of the rain forest repeats this assertion and its corollary that only recently and only in the West have people veered away from the tradition of living in spiritual harmony with nature. To take just one example, while writing this chapter I saw a programme about the Hoatzin bird in Ecuador, and heard the voice-over announce: 'Conserving a species for future use is a practical philosophy that all hunting peoples understand.'

Mysticism undoubtedly plays a large part in the life of tribal people. Some animals are thought to bring good luck; others bad luck. Complicated ceremonies may be performed before or after a hunt. Mountains are assumed to have feelings. Certain creatures are taboo, even if they appear to be edible. Sexual abstinence or fasting may precede an important hunt. True enough, all this, but does any of it work? As Hotspur remarks when the vainglorious Glendower claims that he can call spirits from the vasty deep: 'Why, so can I,

or so can any man; But will they come when you do call for them?' Even if the religious ethic is towards conservation, people do not always live up to their ideals. Christianity preaches virtue, but few Christians are without sin. And even where the rituals do seem to favour conservation, coincidence, not intent, seems a better explanation.

For example, the Cree of Quebec rotate their hunting areas according to scapulimancy, the reading of runes on burnt caribou shoulder-blades. The shaman who reads the bones, remarkably, tells the hunters to avoid areas where game has been depleted by overhunting. Restraint is exercised and the game recovers. But a second's thought shows how flawed such an example is. Avoiding depleted areas makes sense anyway for the most selfish and straightforward of reasons – there is less to hunt. All the shaman does is pass on the information that he gathers from the hunters about which areas are depleted. The bones are irrelevant; they just add to the aura of professional indispensability, like the pompous language of a lawyer.

There have now been four studies of Amazon Indians that have directly tested their conservation ethic, by trying to find evidence that they practise systematic restraint in their hunting patterns to prevent the overexploitation of game. All four rejected the hypothesis. Ray Hames found that Yanomamo and Ye'kwana hunters spend more time in areas where there is more game. Since these areas are generally farther from the village, the hunters usually have to pass through depleted areas to reach these hunting grounds. If they were practising conservation, they would ignore any game they encountered on the way through the depleted area. But they do not. They always – without exception – pursue an animal they happen upon when in the depleted area, so long as it is big enough to be worth wasting effort and ammunition on.[13]

Michael Alvard found the same pattern in the Piro of Peru. With their shotguns (provided by the local priest) and bows and arrows, these Indians kill tapirs, peccaries, deer, capybara, spider monkeys, howler monkeys, agoutis and curassows. They too show a total lack of any systematic restraint in the depleted areas near the village, though they do ignore small game on the way out rather than waste their precious ammunition.[14]

William Vickers studied the Siona-Secoya of Ecuador for fifteen years, collecting records of 1,300 animal kills – the largest database on Amazon hunters ever collated. He recently reanalysed the data to look for evidence of a conservation ethic. He concluded that they did not practise conservation because they did not need to. Their population density was too low and their technology too limited to cause more than very local extinction. In that sense their practice was sustainable, but no thanks to their religious and ritual beliefs. A good shaman is supposed to remedy a shortage of game with spells, not tell the hunters to kill fewer animals. Only in recent years, under the pressure of white colonists and development, have they begun to think about the need to conserve the game in their shrinking forests. But they have done so rationally, not religiously. Conservation, says Vickers, is not a state of being but a rational response to new circumstances.[15]

Allyn MacLean Stearman found that the Yuqui of Bolivia are pure opportunists. They actually prefer to kill pregnant monkeys, or monkeys carrying young – because they are easier to catch and the foetus is considered a delicacy. They are casually cruel to wounded or captured animals. They fish with barbasco poison, which indiscriminately kills all the fish in a small pond or oxbow lake. And they are quite prepared to chop down whole trees to get ripe fruit (they used in days past to employ captured slaves to climb trees) with the result that fruiting trees are now scarce in some areas.[16]

The Rousseauian romantics prefer to believe that the Yuqui are aberrant in some way – bad Indians, rather than good Indians. But this is even more dangerous politics, says Stearman. It threatens to make Indian land rights contingent on their passing some test of ecological virtue, which is a test none should have to pass. 'We aren't nature lovers,' says Nicanor Gonzalez, a leader of the indigenous peoples movement. 'At no time have indigenous groups included the concepts of conservation and ecology in their traditional vocabulary.'[17]

The case of the Kayapo Indians is especially poignant. These inhabitants of central Brazil were interpreted by Rousseauian romantics as enlightened forest guardians. They were thought not only to protect, but also to create, patches of forest in the grasslands called apêtes as reserves for game and other valuable species. On the strength of this report they were granted a 20,000 square-mile reserve called Menkragnoti. The pop star Sting gave them $2 million towards its establishment. Within a few years they had begun an enthusiastic programme of selling concessions to gold miners and loggers.

The call to values

This is not to castigate Indians. It would be cheap and hypocritical of me indeed, sitting in my comfortable house dependent on immense quantities of fossil fuels and raw materials for my everyday needs, to be rude about an Indian just because he has found it necessary to sell some cheap logs for cash with which to buy necessities. He is endowed with vast reserves of knowledge about the natural history of his environment that I could never match – its dangers, its opportunities, its medicinal qualities, its seasons, its signs. He is a better conservationist than me in every conceivable way – simply by virtue of his material poverty. He leaves a smaller and more natural imprint on the planet. But this is because of the economic and technological limitations within which he lives, not because of some spiritual, inherent ecological virtue that he possesses. Give him the means to destroy the environment and he would wield them as unthinkingly as me – and probably with more efficiency.

So why do we destroy the environment? The answer is familiar. Environmental damage is caused by a form of the prisoner's dilemma, except that it is played by many players, not two. The problem in the prisoner's dilemma is to get two egoists to cooperate for the greater good, and to eschew the temptation to profit at the other's expense. Environmentalism is the same issue – how to prevent egoists producing pollution, waste and exhausted resources at the expense of more considerate citizens. For every time somebody exerts restraint, he only plays into the hands of a less considerate fellow human being. My forbearance is your opportunity, exactly as it was in the prisoner's dilemma, only this time the game is even harder to play because there are many players, not two.

Little wonder that environmentalists repeatedly and reflexively call for a change in human nature (or human values, as they prefer to call it). Fondly imagining that our instinctive egoism can be waved aside by persuasive calls to be good – as we saw in Chapter Seven, persuasive calls to be good are themselves a powerful human instinct; obeying them is not – they demand a new set of better values to live our lives by. To make this millennial cry more believable they point to how naturally ecological virtue seemed to come to our 'savage' ancestors. Like Rousseau they imagine that greed was invented just the other day, along with capitalism and technology. And they call for it to be disinvented as spiritual harmony with nature is reinvented.

Yet the conclusion that seems warranted is that there is no instinctive environmental ethic in our species – no innate tendency to develop and teach restrained practice. Environmental ethics are therefore to be taught in spite of human nature, not in concert with it. They do not come naturally. We all knew that anyway, did we not? Yet we persist in hoping that we'll find an ecological noble savage somewhere inside our breast to call out with the right chants and incantations. He's not in there. As Bobbi Low and Joel Heinen put it, 'Conservation philosophies relying on generalized and diffuse group benefits are probably doomed to failure, in the absence of individual or kinship benefits to conservation management. We would be delighted to be wrong, but suspect we are not.'[18]

But take courage! After all, the prisoner's dilemma turned out not to be the archetypal justification of human selfishness, but the reverse. Played repeatedly and discriminatingly, the game always favours the good citizen. Nice strategies like Tit-for-tat, Pavlov and Firm-but-fair win out over nasty ones. Perhaps game theory, too, can come to the rescue of the environmentalist's dilemma. Perhaps it can find a way for self-interested exploiters of the natural world to stop themselves killing the geese that lay golden eggs.