Chapter 5 The Myth of Self- Interest

And the Science of Cooperation

On June 28, 1914, in Sarajevo, Bosnia, the Serbian nationalist Gavrilo Princip rushed to a car in which sat Archduke Franz Ferdinand, heir to the Austro-Hungarian throne, and his wife, Countess Sophie. Princip shot two times, hitting Sophie in the stomach and Franz Ferdinand in the neck. Both died shortly thereafter of their wounds. After accomplishing his mission, Princip swallowed a capsule of cyanide, but the poison was defective and only made him vomit. He then tried to shoot himself with his gun, but it was wrestled from his hand. Princip was tried, sentenced to a life in prison (he was too young for the death penalty), and died four years later in prison from tuberculosis.

One month after the assassination of Franz Ferdinand, and using it as a pretext, Austria-Hungary declared war on Serbia. Russia, who was tied by a defensive treaty to Serbia, began mobilizing, which was treated as a hostile act by Germany. On August 1, Germany declared war on Russia, which dragged into the war Russian allies France and England. World War I had begun.

We know of the carnage and social trauma that ensued, but little is usually made of how overwhelmingly the European populace supported its various governments' decisions to go to war. Patriotic crowds demonstrated for war in Vienna, Berlin, and London. More tellingly, all over Europe hundreds of thousands volunteered for the army. In the British Empire, for example, there was no need to introduce conscription until 1916. Three hundred thousand men enlisted during the first month of the war, and more than 450,000 in the next month. Even on the other side of the world, Australians rode for days to get to towns where they could enlist and begin the long voyage to Europe.

By the end of war, more than 8.5 million were dead from bullet, artillery shell, poison gas, or trench sickness. In France, every sixth soldier mobilized for war was killed. More than half were wounded. Only one soldier in three escaped the meat grinder unscathed in body (if not in soul).

The willingness of the British, the French, and the Germans to fight for their country is only one of the many striking examples of the human capacity to sacrifice self-interest for the sake of a very broad common good. Less

dramatically, we pay taxes, take time to vote, and participate in unions and demonstrations. On a darker side, the willingness of Gavrilo Princip to murder Franz Ferdinand even at the expense of his life, or the eagerness with which Palestinian suicide bombers sacrifice themselves to inflict horror on the Israelis, falls into the same category. The "common good" does not refer to the whole humanity, but only to a part of it, the group for which the sacrifice is made, be it the Serbian, Palestinian, or English nations.

The capacity to sacrifice self-interest for the sake of common good is the necessary condition for cooperation. Without it, concerted collective action is impossible, as I have stressed in the previous chapters. To ancient and medieval thinkers such as Aristotle, Thomas Aquinas, and, above all, Ibn Khaldun, it was obvious that it was cooperation that provided the basis of social life. Beginning in the early modern period, however, this certainty was gradually abandoned by most influential social thinkers. By the end of the twentieth century, the "rational-choice theory," which postulated that people behave in entirely self-interested manner, became the dominant paradigm in the social sciences. Any theories that invoked cooperation as moving force of history were ridiculed as unscientific. If people are motivated entirely by self-interest, the only forces that matter are rewards and punishments.

To trace the development of this shift of paradigms, we might begin with the life and work of that brilliant Florentine political philosopher and statesman Niccolo Machiavelli (1469-1527). In his best work, The Prince, Machiavelli famously asked whether for a ruler "it is better to be loved than feared, or the reverse. The answer is, of course, that it would be best to be both loved and feared. But since the two rarely come together, anyone compelled to choose will find greater security in being feared than in being loved. For this can be said about the generality of men: that they are ungrateful, fickle, dissembling, anxious to flee danger, and covetous of gain. So long as you promote their advantage, they are all yours, as I said before, and will offer you their blood, their goods, their lives, and their children when the need for these is remote. When the need arises, however, they will turn against you. The prince who bases his security upon their word, lacking other provision, is doomed ... Men are less concerned about offending someone they have cause to love than someone they have cause to fear. Love endures by a bond which men, being scoundrels, may break whenever it serves their advantage to do so; but fear is supported by the dread of pain, which is ever present."

Machiavelli's ideas were completely at odds with the prevailing political ideology, and his contemporaries rejected them with horror. A much more conventional wisdom was uttered by the French king Louis IX (1226-70) before his death. When he fell ill, he said to his son and heir, "Fair son, I pray that you make yourself beloved of your people; for truly I would rather that a Scot should come from Scotland and govern the kingdom loyally and well than that you

should govern it ill." The people of his time clearly agreed with this sentiment, and Louis was canonized in 1297, but from the perspective of our cynical age, his words sound hopelessly naive as opposed to the harsh but seamlessly argued case put forward by Machiavelli. On the other hand, although St. Louis was no great shakes as a political thinker, he was a remarkably successful practical politician. Despite some notable setbacks, such as the disastrous crusade in Egypt (1248-50), during his long reign France became the hegemonic power of Europe, famous for the quality (and quantity) of its fighting men, the learning of its university, and the beauty of its Gothic cathedrals. The reign of St. Louis was the golden age of medieval France.

By contrast, Machiavelli was ultimately a failure as politician. He served as secretary to the Second Chancery of the Signoria, and was one of the most trusted associates of Pier Soderini, *gonfalonier* of the republic (the chief magistrate of Florence). Machiavelli's public career spanned 14 years, during which time he represented the republic on several diplomatic missions. He played an important role in the successful subjugation of Pisa by the Florentines in 1509. However, in 1512, the Spanish troops attacked the fortified town of Prato, which guarded the northern approaches to Florence. After only a brief struggle the Florentine militia, recruited by Machiavelli, broke and ran away. Florence surrendered without further resistance, and the Spanish installed the new government headed by the Medici, who had been chased away from Florence 18 years earlier. Soderini was forced to resign and went into exile, and Machiavelli was dismissed from his post and banished. He withdrew to a small farm that his father left him, and there wrote the book that made him famous. The Prince (1513) was addressed to Lorenzo the Magnificent de Medici, and Machiavelli's stated desire was to be reinstated in the government. His plea, however, remained unanswered, and he was forced to rusticate for the rest of his life.

The failure of Machiavelli's political career does not refute his logic. Irrespective of the political success he found in his own life, the truth of any logical construction, no matter how finely reasoned, is only as good as the validity of the premises on which the argument is based. The main premise of the argument in The Prince is that all people behave all the time in a completely self-interested manner—they are motivated solely by the desire for gain and fear of punishment. Is this right?

Although the "self-interest axiom" was vehemently rejected by Machiavelli's contemporaries, as the modern period unfolded it gradually gained ground in the thinking of European philosophers, economists, and other social scientists. In *Leviathan,* Thomas Hobbes (1588-1679) assumed that in the "state of nature"—in the absence of the state keeping order—society would fall apart and degenerate into the war of all against all. A century later, the great Scottish philosopher David Hume (1711-76) wrote, "Political writers established it as a

maxim, that, in contriving any system of government ... every man ought to be supposed to be a *knave* and to have no other end, in all his actions, than his private interest." And this sad truth (that all are knaves) is perhaps not so sad after all—it may even be good for the society as a whole. At least so argued Bernard Mandeville (1670-1713) in *The Fable of the Bees: Private Vices, Publick* Benefits: "Thus every Part was full of Vice, yet the whole Mass a Paradise." This does sound familiar. Wasn't it the motto of the exuberant 1980s and 1990s—"greed is good"?

Back in the eighteenth century, the ideas of Mandeville (as those of Machiavelli before him) were still met with great hostility by the public. Mandeville's book was even convicted as "a nuisance" by the grand jury of Middlesex in 1723. By the end of the century, however, the concept of "Private Vices, Publick Benefits" became a solid part of scientific mainstream, largely due to the work of Adam Smith (1723-90). In his master-piece *The Wealth of Nations,* Smith wrote, "It is not from the benevolence of the butcher, or the baker that we expect our dinner, but from their regard to their own interest." The contribution for which Smith is best known is his "invisible hand" argument. "Every individual necessarily labors to render the annual revenue of the society as great as he can. He generally neither intends to promote the public interest, nor knows how much he is promoting it ... He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for society that it was no part of his intention. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it."

During the twentieth century, the ideas of Mandeville, Smith, and many others have been developed and systematized into what is now known as "the theory of rational choice." The core of the theory is the postulate that people—"agents"—behave in such a way as to maximize their "utility function." In principle, the utility function could be almost anything, but in practice almost all applications of the theory in the mainstream economics equate utility with material self-interest. In the most basic version, the utility is simply the dollar amount that an agent expects to get as a result of a certain action. The agent then should perform the action that yields the greatest payoff—this is what "maximizing utility" means. Agents that behave in ways that maximize their utility functions are "rational."

The premise that all people are exclusively pursuing their self-interest is a parsimonious assumption with truly astonishing implications. It turns out that the price of a loaf of bread or a used Ford, the salary of a trained nurse, the interest you have to pay on your mortgage, and even divorce rates, or how many people want to get college education—a broad variety of economic and social phenomena can be adequately explained by the rational choice theory. Scientists in all disciplines prize theories that explain a large variety of facts by making the

smallest possible number of assumptions, and the theory of rational choice excels at it.

There is, however, one area where the rational choice theory fails utterly-in explaining why people cooperate. Take volunteering for the army when your country is attacked. The cost—the risk of injury or death—is substantial. The benefit—preventing the defeat that might entail paying war reparations, being evicted from your home, enslaved, or even killed—is also substantial. However, the cost of enlisting you bear directly, whereas the benefit is shared equally among everybody (what economists call the public good). Your participation, or not, in the army of millions is not going to make any appreciable difference to the outcome of the war. By failing to join the army, you will reap all the benefits of victory without bearing any of the costs. According to the rational choice theory, this is precisely what a rational agent should do. Of course, if everybody behaves in this rational manner, nobody will volunteer, and the invaders will win. If nobody volunteers, however, you have even more reason not to enlist—a one-person army is certainly going to be defeated. In other words, whatever others do, it is in your interest not to enlist (to "defect"). In a society of rational agents, everybody will defect, with the end result that collective action will always fail. The economist Mancur Olson called this logical deduction the "collective-action problem."

What about forcing people to cooperate? For example, we might establish firing squads that would go to towns and villages and shoot everybody who fails to volunteer. When faced with a choice of being shot here and now, or joining the army and taking one's chances, the rational agent would of course "volunteer." But who will constitute the enforcement squads? Certainly not rational agents. Participation in the enforcement squad is personally costly (you might get killed by rioting draft evaders), whereas the benefit (getting an army together and resisting the invaders) is again spread evenly among all. In other words, the same logic applies as with enlisting in the army in the first place. (In the technical jargon, this is known as the "second-order collective-action problem.") Perhaps we should punish those who do not join punishment detail? This is the suggestion of the famous graffiti in Boston scribbled by an opponent of Jay's Treaty in 1795: "Damn John Jay! Damn everyone who won't damn John Jay!! Damn everyone that won't put lights in his windows and sit up all night damning John Jay!!!" But no, forcing self-interested people to join enforcement squads also does not work—it leads to infinite regress, the third-order collective-action problem, then the forth-order one, and so on. It turns out that if everybody is a rational agent, it is impossible to bring about cooperation, even by force.

Rational self-interested agents cannot join together in a functioning society—this could be one of the fundamental theorems in sociology. In a world where all individuals behave strictly rationally, armies would run away at the first shot (or would not even get together in the first place). Nobody would vote or pay taxes.

IRS agents would accept bribes not to prosecute tax evaders, and then pass some fraction of that to the members of the Senate overseeing committee, to buy *them* off. The courts would make verdicts in favor of whoever can pay more, or has more power to intimidate the judges and juries. The police would let criminals go in exchange for part of their loot. Actually, I am painting too rosy a picture—when all behave in a purely self-interested manner, there will be no IRS, courts, or police. There could only be a Hobbesian war of all against all.

AT THE SAME TIME THAT THE social scientists were perfecting the theory of rational choice, biologists were doing the same for the theory of evolution by natural selection, reaching very similar conclusions. The biological counterpart of utility is "fitness"—the expected number of viable offspring contributed by an organism to future generations. Just as rational agents maximize utility, evolution maximizes fitness: The genes that endow their carriers with greater ability to survive and reproduce increase in the population by virtue of the inevitable fact that they make more copies of themselves than their competitors.

The theory of evolution by natural selection is the most successful theory in biological sciences; in fact, modern biology is unimaginable without it. Yet for a long time, beginning with Charles Darwin himself, there was one puzzle that bothered evolutionary biologists—how could sociality evolve. Take the beehive. If you try to plunder its honey, you will be immediately confronted with an angrily buzzing swarm of bees. If you do not have protective clothing, you will be stung many times. A bee cannot withdraw its barbed sting from the skin of the victim, so the inevitable result of its attack is that the sting is torn out of its abdomen, and the bee dies. Thus, its defense of the hive is a true act of self-sacrifice, and herein lies the puzzle. Natural selection should weed out such "altruistic" genes—when you sacrifice yourself, you reduce your fitness to zero.

Sacrificial defense of the hive is a highly visible feature of bees, but in a quieter way they, and other social insects such as wasps, ants, and termites, do something even more puzzling—they give up their ability to reproduce. Only one individual produces offspring in a hive, the queen. All workers are sterile female. (The hive also produces male drones, but these do not participate in hive's functioning.) By giving up their ability to reproduce, worker bees reduce their fitness to zero. Again, on the face of it, such traits should be weeded out in the process of evolution.

The decisive breakthrough in our understanding of the evolution of sociality in nonhuman organisms came in 1964 when the British biologist William D. Hamilton advanced the theory of kin selection. We know that all bees in a hive are sisters and, due to a quirky genetic makeup of Hymenoptera (a group that includes wasps and ants), a bee shares three quarters of her genes with any of her hive mates. (In most other animals, including humans, the siblings share only 50 percent of genes with each other.) Now suppose that by a selfless act of hive defense a bee, at the expense of her life, will save enough honey on which

to raise, say, four new sisters. An altruistic gene programming the bee for this behavior will be favored in the process of evolution, because by sacrificing one copy of itself in the defender bee it will produce three more copies in the new bees. Expending one copy to get three is an excellent deal from the point of view of natural selection, and such altruistic genes will spread in the population.

The second important strand in evolutionary research that has a bearing on human sociality is the idea of "reciprocal altruism" developed by the biologist Robert Trivers and the political scientist Robert Axelrod. Consider the following situation. Giovanni, a merchant of Venice, entrusts Lorenzo, the captain of a ship, with a certain sum of money. Lorenzo promises to travel to Cairo, purchase oriental spice there, and carry it back to Giovanni, who will sell it at a profit and pay Lorenzo a handsome fee. Suppose also that there is no way to write an enforceable contract (maybe the Venetian Republic has imposed a blockade on Cairo, and therefore the deal is illegal). If Lorenzo is a rational agent, he should accept the money from Giovanni, but upon return simply sell the spice himself and pocket the proceeds. But Giovanni is also a rational agent, so he will figure out that Lorenzo will cheat him, and therefore Giovanni will keep his money No business is transacted, and both "agents" are the poorer for it. If the interaction between Giovanni and Lorenzo is a one-shot affair, the rational strategy for both is to "defect" (fail to cooperate). This failure to cooperate is really a special case of the collective action problem, but instead of a large group, just two individuals are involved.

If Giovanni and Lorenzo have a long-term relationship, however, in which they have an opportunity for repeated deals over the years, the logic of the situation is completely transformed. Now Giovanni can do much better by adopting the strategy known as "tit-for-tat": cooperate on the first round, and then do as the partner does. Accordingly, Giovanni entrusts Lorenzo with the money, and if Lorenzo fulfils his part, next year Giovanni does it again (and again, and again). If Lorenzo cheats Giovanni, Giovanni cuts him off and takes his business elsewhere. But Lorenzo will not cheat, because he calculates that he will derive more profit from many future deals than he would from cheating in a single one. Therefore, in the situation where interactions are repeated, a pair of rational agents can sustain cooperation via the mechanism of reciprocity. Many examples exist of reciprocal altruism among animals, such as the mutual grooming in monkeys. You scratch my back, I'll scratch yours.

The theories of kin selection and reciprocal altruism transformed our understanding of how animal societies evolved. But what about humans? In the 1970s, evolutionary biologists, of whom the most notable was Edward O. Wilson of Harvard University, flushed with success in understanding nonhuman sociality, decided to invade the traditional turf of social scientists and created the new science of "sociobiology." Richard Dawkins, the author of the wildly popular and influential book *The Selfish Gene* proclaimed in 1976: "We are

survival machines—robot vehicles blindly programmed to preserve the selfish molecules known as genes." And it is true that kin selection, for example, helps us understand many human behaviors, such as nepotism. Kin selection and reciprocal altruism, undoubtedly, played an important role in the early phase of the evolution of human sociality. But even "primitive" human societies, like bands of hunters and gatherers, are not composed of relatives only. There are too many nonrelatives for kin selection to explain their behavior. When meat of a large animal is meticulously shared out among the band members, many recipients are very distantly related to the hunter who brought in the game, or even not related at all. At the other extreme of social complexity, when a Frenchman enlisted in the army in 1914, the vast majority of his 40 million countrymen and women had no blood relation to him whatsoever. Hamilton's insight does not really help us understand human "ultrasociality" —extensive cooperation among large numbers of unrelated individuals. Humans, among all living creatures, appear to be unique in the extent to which they cooperate with nonrelatives.

What about reciprocal altruism? Does this help us understand how we can solve the collective-action problem involving many people? Unfortunately not, as David Hume saw in the eighteenth century: "Two neighbors agree to drain a meadow, which they possess in common; because 'tis easy for them to know each other's mind; and each must perceive, that the immediate consequence of his failing in his part is abandoning of the whole project. But 'tis very difficult and indeed impossible, that a thousand persons shou'd agree in any such action; it being difficult for them to concert so complicated a design, and still more difficult for them to execute; while each seeks a pretext to free himself of the trouble and expense, and wou'd lay the whole burden on others." Modern research using formal mathematical models confirmed this intuition. When the group size becomes large enough, cooperation among rational agents unravels as free-loading becomes rampant. The collective-action problem strikes again.

In the final analysis, although they made valuable contributions to the debate, sociobiologists failed to explain human ultrasociality In the last chapter of *The Selfish Gene,* Dawkins himself acknowledged, "Kin selection and selection in favor of reciprocal altruism may have acted on human genes to produce many of our basic psychological attributes and tendencies. These ideas are plausible as far as they go, but I find that they do not begin to square up to the formidable challenge of explaining culture, cultural evolution, and the immense differences between human cultures around the world."

This is where matters stood about a decade ago, during the mid-1990s. Mainstream theories, rational choice in social sciences and natural selection in biological sciences, could not explain cooperation among large numbers of unrelated individuals. According to the scientific understanding of the time, human ultrasociality was, we're sorry, impossible. Anomalies such as, for

example, World War I were generally ignored. Some scientists tried to explain such instance of mass cooperation away. Perhaps enlisting in the army was an atavistic cooperative impulse, which evolved by means of kin selection when primordial humans lived in bands of relatives, and now was somehow triggered by nationalistic war propaganda. In other words, volunteers behaved in truly irrational fashion, both in the technical and common senses of the word; they were somehow "fooled." Or perhaps they were purposefully fooled—manipulated by the Machiavellian elites into spending their blood for the sake of the capitalists' profits.

Another group of scientists neither ignored nor tried to explain away such anomalies. Working in a truly interdisciplinary fashion, these biologists, anthropologists, sociologists, and economists finally cracked the puzzle of human ultrasociality. Not all of the loose ends have been tidied up yet, but the general outlines of the answer are becoming quite clear.

BEFORE WE TRY TO EXPLAIN SOMETHING, we need to assure ourselves that the phenomenon to be explained is real. The wave of volunteering at the beginning of World War I is a striking example of human capacity to sacrifice self-interest, but it is a single and highly complex event, open for diverse interpretations. The best way to proceed in science is through experiment—a study performed to verify or falsify a hypothesis while controlling or even manipulating external conditions. During the 1990s, several economists, most notably Ernst Fehr at the University of Zurich and his colleagues, decided to test the assumptions of the rational choice theory experimentally. This was a significant break within the scientific culture of economics, where most researchers had either constructed abstract and rigorous mathematical models or applied statistical methods to huge data sets on things such as inflation and economic growth.

One kind of experiment, which has now been conducted by a number of investigative teams, is called "the public goods game." Subjects are divided up in groups of four and given an initial endowment of $10 each. The game is played in 10 rounds. Every round each participant can contribute any part, from 0 to 10 dollars, to the group project. The experimenters first double the total amount contributed to the common account, and then divide it up equally among all participants. Thus, for each dollar contributed to the common pot, a participant gains back only 50 cents. On the other hand, he or she also gains 50 cents for each dollar contributed by others. If all participants contribute the maximum amount ($10), they would end up with $20 each, doubling their initial endowment.

Clearly a rational, self-interested player will contribute nothing to the common pot, keeping the initial stake plus whatever gains come from the cooperative behavior of the others. In the best case, when the other three all contribute the maximum, the "free-rider" would get $15 in addition to the initial stake, for a

total of $25. However, others will make the same calculation and also contribute nothing, so everybody is left with $10, instead of the maximum cooperative payoff of $20. Thus, the rational choice theory predicts that there will be no cooperation.

Real people did not behave in the way predicted by the self-interest hypothesis. The average contribution to the common pot in the early rounds was about half the endowment. In other words, people started halfway between the fully cooperative and fully self-interested positions. In subsequent rounds, however, cooperation gradually unraveled, and on the last round three quarters did not contribute anything at all, while most of the rest contributed just a dollar or two. Did this happen because the participants were stupid, so that it took many rounds for them to figure out the rational strategy? No, because in the post-experiment interviews many subjects told the researchers that they grew increasingly angry at those who did not contribute and punished them the only way they could—by curtailing their contributions to the common pot.

To test whether this was the real reason, the researchers added a modification to the basic game. Now, after each round, the participants were told how much other group members contributed, and they could punish free-riders at a cost to themselves. For every dollar forked out by the punisher, the punished was fined three. As discussed previously, punishment cannot force rational agents to cooperate, because it is the second-order collective good. In the context of the public goods game with punishment it is downright irrational to pay out punishment dollars for no personal gain. Therefore, the self-interest hypothesis predicts that the punishment option should not change the outcome of the game in any way. Yet adding punishment completely reversed the trend to declining cooperation. As before, participants started by contributing on average a half of their endowment. But this time there was a significant amount of punishing activity directed against the free-riders, and after a few rounds the average contribution to the common pot climbed up to nearly the maximum, and stayed there to the last round.

What these experiments, and many others like them, reveal is that the society consists of several types of people. Some of them—perhaps a quarter in experiments with American students—are self-interested, rational agents—"the knaves." These will never contribute to the common good and will choose free-riding, unless forced to do so by fines imposed on them. The opposite type, also about a quarter, are the unconditional cooperators, or "the saints." The saints continue to contribute to the common pool, and lose money, even when it is obvious to everybody that cooperation failed (although most of them reduce the amount of their contribution). The largest group (40 to 60 percent in most experiments) is the conditional cooperators or "the moralists." The preference of moralists is to contribute to the pot so that everybody would be better off. However, in the absence of the mechanism to punish noncontributors, free-

riding proliferates, the moralists become disgusted by this opportunistic behavior and withdraw their cooperation. On the other hand, when the punishment option is available, they use it to fine the knaves. To avoid the fines, the knaves grudgingly begin contributing. Once free-riding has been eliminated, the saints and the moralists can follow their prosocial preference of contributing the maximum. The group achieves the cooperative equilibrium at which, paradoxically, the moralists do almost as well as the knaves, because they now rarely (if ever) need to spend money on fining the free-riders.

Experiments employing the public goods and similar games have now been conducted by many teams of investigators in many countries. In some studies, stakes were very high—equivalent to three months of salary. The general result is always the same. A substantial proportion of moralistic subjects always behaves in a cooperative, rather than rational fashion, and many people are willing to incur personal costs to punish cheaters. This is not to say, however, that all social groups are alike in their composition with respect to knaves, saints, and moralists. College students, for example, tend to be more cooperative than subjects coming from less-educated and poorer social strata. Graduate students in economics, on the other hand, tend to behave more selfishly than students from other disciplines (probably because they learn too much about rational choice in their classes!). Most interestingly, the strength of cooperative behavior tends to vary among different countries. Particularly good evidence for cross-cultural variation comes from studies that used the "ultimatum game," which is simpler to set up and cheaper than the public goods game.

The ultimatum game is played between two people, the "proposer" and the "responder." Anonymous subjects are paired for a single interaction (which precludes any possibility of reciprocal altruism based on preexisting long-term relationships). The task is to divide up "the pot" of $10. The proposer offers a certain proportion of the pot to the responder. (The proposal must be expressed in whole dollars.) If the responder accepts, the proposer keeps the rest of the pot. If the responder rejects the offer, nobody gets anything. If this game is played by purely self-interested agents, the theory predicts that the responder should accept any nonzero offer. Knowing this, the rational proposer will offer the minimum nonzero amount, which is $1. On the other hand, if the responder is a moralist, he will reject any offer deemed unfair. In a society with a strong norm of fairness, the moralistic responders will insist on the 50:50 division of the pot. They will certainly reject offers of one or two dollars. Knowing this, even a knavish proposer will make a fair offer. By now it should come as no surprise that in no real society that has been investigated with the ultimatum game, people behave according to the prediction of the self-interest hypothesis.

When the game is played with university students from industrial societies, cross-cultural variation is not huge, although detectable. For example, one study found that the most frequent offer made by the American and Slovenian students

was precisely half the pot, whereas in Israel and Japan the modal offer was lower, 40 percent of the pot. In Israel, there was also a substantial number of low offers (10 to 30 percent of the pot), which were very rare in the other three countries. The probability that a low offer would be rejected was highest in the United States and Slovenia, intermediate in Japan, and the lowest in Israel. Thus, lower propensity by responders to reject an unfair offer depressed the average offer amount made by proposers.

The researchers went around the world and played the ultimatum game in 15 small-scale traditional societies, which included hunter-gatherers, herders, and farmers. The amount of cross-cultural variation found in these small-scale societies was much greater than in the modernized ones (although in no society did people behave as would be predicted by the self-interest axiom). The Machiguenga of Peru made the lowest offers. Three quarters of proposals were 25 percent of the pot or less, and there was only one case of rejecting a low proposal. The Machiguenga economy is entirely focused on the household; almost no productive activity would require cooperation outside the members of the family. Same story with the Quichua of Ecuador—poorly integrated society, low offers in the ultimatum game. By contrast, the Ache of Paraguay practice widespread meat sharing and cooperation on community projects. "Aché hunters, returning home, quietly leave their kill at the edge of camp, often claiming that the hunt was fruitless; their catch is later discovered and collected by others and then meticulously shared among all in the camp." The average proposal made by the Ache was 51 percent of the stake, almost precisely the 50:50 split predicted by fairness considerations. The Lamelara whale hunters of Indonesia go to sea in large canoes manned by a dozen or more individuals. Close cooperation is critical for a successful hunt. In the ultimatum game the Lamelara are super-fair-the average proposal was 58 percent of the stake.

Generally speaking, the average offer amount among the 15 societies was correlated with the probability of rejecting a low offer. But there was one exception. The overwhelming proportion of offers rejected by the Au and the Gnau of New Guinea were those that were high (greater than half of the pot). Among these groups, accepting a large gift puts the receiver under a strong obligation and into a subordinate position with respect to the giver. As a result, such gifts will be frequently refused, and this cultural quirk was reflected in the way people played the ultimatum game. Another example of how culture can be reflected in the manner with which people behave in the experimental setting is the Orma. This herding people in Kenya practice wide-scale cooperation. When they decide to build a new school or a road, members of the community are asked to contribute, with the wealthier (those who have larger herds) contributing proportionally more. This system is called *harambee.* When the public goods game was explained to the Orma, they quickly dubbed it a

harambee game. Interestingly, their contributions in the game were strongly correlated with their real-world wealth, as it would be in *harambee.*

THE BEHAVIORAL EXPERIMENTS USING THE public goods and the ultimatum games decisively prove that Machiavelli's self-interest premise was wrong. It is simply not true that *all* people behave in *entirely* self-interested manner. Some people—the knaves—are like that. However, other kinds of people, whom I have called the saints and the moralists, behave in prosocial ways. Furthermore, different societies have different mixtures of self-interested and cooperative individuals. Cultural practices (for example, the *harambee* system) and social institutions have a strong effect on whether and how collective action can be sustained.

The experiments also point to the key role of the moralists. Kindly saints are completely ineffectual in preventing cooperation from unraveling. In the absence of effective sanctions against free-riders, opportunistic knaves waste any contributions by the saints to the common good. Self-righteous moralists are not necessarily nice people, and their motivation for the "moralistic punishment" is not necessarily prosocial in intent. They might not be trying to get everybody to cooperate. Instead, they get mad at people who violate social norms. They retaliate against the norm breakers and feel a kind of grim satisfaction from depriving them of their ill-gotten gains. It's emotional, and it's not pretty, but it ensures group cooperation.

A recent experiment, conducted in Zurich by Fehr and colleagues, confirms that emotions play a strong role in moralistic punishment. As in other studies, the experiment involved human subjects playing a variant of the public goods game. The new twist was that the researchers scanned brain activity of the subjects who were contemplating whether to punish a cheater. The brain scan showed that when a player was deciding on punishment, a spike of neural activity occurred in the region of brain known as the caudate nucleus. The stronger the nucleus fired, the greater was the fine imposed by the subject on the norm violator. The caudate nucleus is known to be involved in the processing of rewards. More specifically, it has an important role in integrating reward information with goal-oriented behavior. The implication of the experimental findings, therefore, is that the subjects were anticipating the satisfaction of punishing the cheaters. The individuals who derived more pleasure from revenge (whose caudate nuclei fired particularly intensely) were willing to fork out more dollars to impose a heavier fine on the cheater.

Other groups of researchers in New Jersey, Texas, and California are also busily scanning brains of experimental subjects contemplating social choices—to trust or not? To punish or not? A whole new hot discipline, called neuro-economics, was born in the last few years. The results churned out by different research groups are striking. They indicate that the capacity for trust and moralistic punishment are wired into our brains. At some level, they are as basic as our

abilities of obtaining food or finding mates. It does not mean that all humans will always behave in a cooperative manner. People are different—some are knaves, others moralists. Societies differ in their ability to sustain collective action. But the capacity for cooperation (even if it is never exercised by many people) is part of what makes us human. Machiavelli was wrong.

WHAT DOES IT MEAN FOR OUR theories of social and economic dynamics? First, there is no need to flush the theory of rational choice down the drain. Science typically advances in an incremental way, by building on earlier successes, and the development of our ideas about cooperation is not an exception to this principle. Remember that the theory assumes that rational agents maximize a "utility function," which in the general case need not be only material self-interest. It is quite straightforward to include in the utility function the prosocial inclinations of some individuals, and in fact theoretical economists have already started doing that. This research shows that in some kinds of circumstances prosocial inclinations do not matter, and we obtain results identical to the classical theory built on the self-interest assumption. Take price formation in the markets, one of the greatest successes of the classical theory, as developed by Adam Smith. Moralistic individuals may bitch and moan about not getting the "fair price," but the invisible hand of the market will inexorably set the price at the level determined by supply and demand.

In other kinds of situations, prosocial norms held by part of the population will result in an outcome completely at variance with the standard theory. Take the example with which this chapter started. From the point of view of the self-interest hypothesis, massive volunteering for the army is incomprehensible. But being familiar with the results from the public goods game and similar experiments, it is easy to understand what went on. The initial surge of volunteers must have been entirely saints and moralists. After enough moralists joined up, they put a lot of pressure on the knaves to do the same. In England during World War I, particularly effective were the female moralists who could not serve themselves but had husbands and sons in the army. Here's an eyewitness account by William Brooks, who joined the army in 1915: "Once war broke out the situation at home became awful, because people did not like to see men or lads of army age walking about in civilian clothing, or not in uniform of some sort, especially in a military town like Woolwich. Women were the worst. They would come up to you in the street and give you a white feather, or stick it in the lapel of your coat. A white feather is the sign of cowardice, so they meant you were a coward and that you should be in the army doing your bit for king and country. It got so bad it wasn't safe to go out. So in 1915 at the age of 17 I volunteered under the Lord Derby scheme. Now that was a thing where once you applied to join you were not called up at once, but were given a blue armband with a red crown to wear. This told people that you were waiting to be

called up, and that kept you safe, or fairly safe, because if you were seen to be wearing it for too long the abuse in the street would soon start again."

Lest the import of this quote be misinterpreted, it is worth reiterating that pure coercion is not the explanation of why the British enlisted in huge numbers in the World War I. *Some* undoubtedly were forced to enlist by the tactics described in the previous paragraph, but others enlisted out of sheer patriotism; yet others were motivated by a mixture of patriotism and fear of harassment. Furthermore, the harassment of shirkers by the British women is emphatically not a self-interested behavior. By inducing another man to enlist, they did not better the survival chances of their husbands or sons in any appreciable way. These women put pressure on men to enlist not out of self-interest, but because of the expectations of their society at large, or more precisely, social norms.

Cooperative inclinations played a large role in explaining mass volunteering, but it would be simplistic and wrong to say that the whole nation spontaneously and uniformly rose up to smite the enemy. Just as it would be simplistic and wrong to say that all the British enlistees were coerced to join. The explanation requires a more nuanced and dynamic understanding.

EACH SOCIETY CONTAINS A SUBSTANTIAL proportion of people who, in addition to looking out for their material interest, are also motivated, at least in part, by social norms. So how did it come about that adherence to such norms became widespread in humans? Doesn't the theory of natural selection predict that such altruistic behaviors could never evolve? For an explanation, we need to look to some recent developments in evolutionary biology and anthropology.

Actually, Charles Darwin himself was concerned with the apparent problem altruistic behavior presented to his theory of evolution. "Selfish and contentious people will not cohere, and without coherence, nothing can be effected. A tribe possessing ... a greater number of courageous, sympathetic, and faithful members, who were always ready to warn each other of danger, to aid and defend each other ... would spread and be victorious over other tribes." The mechanism, proposed by Darwin, is now known as "group selection"—cooperation within groups evolves as a result of competition between groups. During the twentieth century, group selection went on a dizzying roller coaster, first enjoying wide acceptance, then being completely repudiated, and now on its way back to prominence, although in a different, more mature form. The problem was that during the first stage of uncritical acceptance, a lot of very bad theory was propounded by the adherents of the concept such as the famous Austrian ethologist Konrad Lorenz in his book On *Aggression.*

The main problem with the initial, crude version of the group-selection theory is this. Think about two types, altruistic "saints" and self-interested "knaves." It is true that groups that have many saints will be doing better than groups with lots of knaves. However, in addition to this between-group competition, there is a

within-group competition between saints and knaves, which saints inevitably lose. This is the collective-action problem, all over again. The benefits from prosocial actions of the saints are spread evenly among all group members, including the knaves, but the costs are born entirely by the saints. As a result, the saints will suffer higher mortality and lower reproduction rate compared to the knaves. Overall, numbers of saints will change as the result of two opposing tendencies: between-group competition that causes saint numbers to increase, and within-group competition that causes their numbers to decline. It is hard to say which process will prevail without doing calculations. Unfortunately for the group-selection theory, mathematical models show that, except under quite unusual circumstances, the individual (within group) selection will almost always overwhelm group selection.

By the 1970s, this mathematical result was widely known, and it became fashionable to make fun at the expense of the "naive" proponents of group selection. The said proponents crawled into various holes with their tails between the legs (with a few exceptions, most notably David Sloan Wilson at Binghamton University, who continued to plug on in almost total isolation). The "individual-selectionist" view became the dogma in the field of evolutionary biology as seen in, for example, Richard Dawkins's book *The Selfish Gene.*

Yet, although Dawkins and others pronounced that there is just one dominant unit on which natural selection operates—the individual—in Dawkins' own book he discusses at least three distinct units of selection. These units are the gene (which is reflected in the very title), the individual, and the group of relatives (Hamilton's kin selection). Individuals, after all, are not unitary, structureless "atoms" (despite the name—*individuum*—meaning "undividable"). They are made up of organs, tissues, and cells, and each cell contains many genes. It might be in the common interest for genes to cooperate to ensure the cell's proper functioning, but there could also be incentives for selfish genes to free-ride on this collective effort. Similarly, cells usually cooperate to promote the survival and reproduction of the organism, but at times this cooperation breaks down, and a bunch of knavish cells begins to increase at the expense of the cooperative ones. We know this as cancer. To cut a long story short, things are not quite as simple as Dawkins and other adherents of individual selection imply. In recent years, Wilson and colleagues were able to mount a successful attack on the individual-selectionist dogma. It is now becoming broadly accepted that natural selection operates at all levels simultaneously—genes, cells, organisms, groups of relatives, and simply groups.

It is true that among nonhuman organisms, under most conditions, group-level selection is quite weak. Empirical examples of group selection in nature are rare. Humans, on the other hand, are unique in the biological world in their capacity for thought, communication, and culture, and this makes group-level selection a very powerful force. The best current explanation of how human ultrasociality

evolved is the theory of cultural group selection, advanced by the UCLA anthropologists Robert Boyd and Peter Richerson.

Probably the most important difference between humans and other organisms is the unique importance of cultural transmission of behaviors in humans. This is not to say that genes are unimportant in influencing the behavior of people. Studies of twins separated at birth have decisively shown that genetic makeup has a strong effect on behavioral traits, ranging from intelligence to political orientation. In the age-old debate on "nature versus nurture," neither of the extreme positions is right; the truth lies squarely in between. Moreover, nature and nurture collaborate in determining behavior of people. Genes do not really tell people to vote Republican. Rather, certain genetic makeup can predispose people to conservative views, but whether they become card-carrying Republicans, or not, will depend very much on the family upbringing and accidental experiences throughout their life, such as reading a particular book or making a particular friend.

What makes cultural transmission really distinct from genetic inheritance is that people can learn from other people, not only from their parents. Young people adopt certain behaviors by imitating a particularly successful or charismatic individual in their tribe. They are also taught many things by the tribal elders, from catching fish to telling the truth. The point is that behavioral practices can spread rapidly within a group by this process of cultural transmission, much more rapidly than if the transmission process were determined solely by genes. Of course, any kinds of behaviors can spread by imitation and teaching, both beneficial and harmful for the group. That is why the competition between groups is so important—it weeds out groups that have fixated on harmful practices. For example, take the ritual consumption of the brains of deceased relatives among the Fore people of New Guinea. This turned out to be a bad practice because it allowed the transmission of a neurodegenerative disease known as Kuru. Had Shirley Lindenbaum and Daniel Gajdusek not discovered the cause of the disease, the Fore would have eventually succumbed and been replaced by other tribes that did not eat dead relatives.

Humans have large brains and highly developed cognitive abilities. Apparently, people can keep in their minds information about the history of dealings within a group of more than a hundred people, remembering those who keep their word versus the cheaters. Furthermore, evolutionary psychologists Leda Cosmides and John Tooby argue that there are specialized "cheater-detection circuits" that allow a potential cooperator to detect individuals who free-ride. In short, people are very smart when it comes to social interactions. This unique ability of humans enables us to become very efficient moralists. Remember that a moralist not only behaves according to the norms, but also detects and punishes cheaters—people who break such social rules. A "second-order" moralist also

keeps track of those who shirk by not punishing cheaters, and punishes *them* ("Damn John Jay! Damn everyone who won't damn John Jay!!").

As far as we can tell, the social organization of our distant evolutionary ancestors was not too different from that of the chimps. Unlike chimps, however, who enjoy eating meat but can capture only small prey, our ancestors learned how to hunt large game in the savannas of Africa. Humans eventually learned (perhaps too well) how to kill large mammals, including the largest ones such as elephants and mammoths. When they spread out of their ancestral Africa to other continents, prehistoric humans wiped out most of the large animals living there. That is why the mammoths of Siberia or giant sloths of South America are no longer with us. Unlike African species, large animals elsewhere did not co-evolve with humans and, as a result, had no defense against their predatory ways. What made primitive humans such fearsome killers? Not their teeth or claws, obviously, but their ability to hunt cooperatively.

Taking up hunting of large game exposed early humans to intense selection at the group level. Not only coordination was key to a successful hunt for large game, but moving to regions where such prey are found exposed humans to formidable predators. Only collective vigilance and cooperative defense could protect humans against saber-tooth tigers and cave bears. Again, humans got so good at dealing with these predators that they eventually exterminated them.

Even more importantly, as humans got better at hunting large game, they also got better at killing other humans. At some point, warfare (that is, any kind of organized fighting, from several chimps waylaying and killing a member of a different band to trench warfare involving millions during World War 1) became the most important force of group selection. Several kinds of evidence show that early humans practiced extensive warfare. For example, we know that interband warfare is very common among the chimps, our closest evolutionary relatives. Warfare is also nearly ubiquitous among the small-scale societies of hunter-gatherers and farmers. The anthropologist Lawrence H. Keeley presents evidence that somewhere between 20 percent and 60 percent of males in these societies die in wars. By an argument of "interpolation," therefore, if both chimps and modern pre-state people practiced extensive warfare, so must have our human ancestors. There is also direct evidence—cave paintings depicting lines of warriors shooting at each other, defensive walls around Mesolithic settlements, arrowheads embedded in skeletons, and mass burials of fighting-age males, many of whom were killed by a blow to the head.

It is easy to imagine how prosocial behaviors that benefit the group could evolve in early humans. Consider, for example, the following theoretical scenario of evolution of moralistic punishment. Suppose our apelike ancestors had already evolved the behavior that I will call "familial moralism"—cooperate with close relatives and punish any of them who attempts to free-ride. The punishment part is important, because we know that relatives do not all automatically cooperate.

Any family can have a "black sheep" or a prodigal son. Or a daughter who refuses to sacrifice herself for the benefit of the family, when she rejects an old and repulsive but wealthy suitor. Sanctions are needed to keep family members in line, from spanking a naughty child to disinheriting a disobedient daughter or a wild nephew. Evolution of this behavior is noncontroversial because it is driven by kin selection. Kin groups consisting of familial moralists would be able to achieve a higher degree of cooperation, and greater fitness, than groups consisting of those who cooperate with relatives, but do not punish uncooperative ones. As a result, familial moralism will spread through the population.

Now suppose that a cognitive mutation arises in a population of familial moralists. Instead of limiting cooperation (and punishment of noncooperators) to relatives only, these mutants also—"mistakenly"—cooperate with unrelated people they know, friends. Although I am describing here a hypothetical scenario, it is likely that human sociality evolved precisely by this kind of mutation. Just think how readily kinship terms enter our discourse when we want to promote cooperation—a *band of brothers, the father of a nation, or our motherland.*

Once the true (as opposed to familial) moralistic behavior arose, groups containing moralists acquired the ability to raise larger war bands, because they were not limited to relatives. Cooperation within the enlarged war parties was sustained by moralistic punishment of free-riders, so that they were as cohesive as the smaller parties consisting of familial moralists. Thus, group-level selection favored the spread of true moralistic behaviors. At the same time, within-group (individual) selection against the moralists was extremely weak, because after the moralists tip the group over to a cooperative equilibrium, punishments become so infrequent that they hardly impose any costs on the moralists. Slowly but surely, large bands dominated by moralists displaced smaller groups in which the only basis of cooperation was kinship.

In the scenario of group selection described above, it is not even necessary to assume that all members of defeated bands were physically destroyed. More likely, defeated bands simply disintegrated or disbanded, with their members seeking admittance to other surviving bands. Furthermore, cultural group selection operates on a much faster time scale than genetic group selection. If a moralistic individual turned out to be a very successful hunter or a particularly charismatic person, he or she would be emulated by the young members of the group. The moralistic behavior, then, will rapidly spread within the group. However, other groups are also observing what the successful group is doing, and can imitate its various practices. Moralism in the form, say, of a religious commandment from Muhammad can spread rapidly to other groups. Of course, cultural imitation can spread not only group-beneficial practices, but also harmful practices. A band initially dominated by moralists may happen to

include a highly charismatic knave, who will influence people around him. But as knavery spreads through the band by the process of cultural imitation, the group will lose its internal cohesion and succumb to the moralistic bands in the neighborhood. In other words, it is competition between groups that ensures that prosocial behaviors spread and flourish. Cultural transmission facilitates and speeds up the evolution.

Recall the situation on the Roman frontier in northwestern Europe. When they first came in contact, the Romans were clearly superior in their military ability to the various Germanic tribes. The Romans did many things differently; so what should the tribesmen have imitated? The Romans did not wear pants, but any German foolish enough to imitate that aspect of the Roman cultural package would not survive the next winter, never mind the next night out partying with the guys. On the other hand, the Romans had discipline and fought in close ranks. When the Germans imitated this particular cultural practice, they found that it worked for them, too. The point is that we do not even have to assume that imitators know what they are doing. By imitating enough cultural elements of a successful group, they will eventually hit on the ones that bring success. In the process, they will probably also adopt many irrelevant, but harmless practices. (The harmful ones will be eventually weeded out by group selection.) And humans are quite smart, so they will often figure out precisely just what behavior they need to imitate.

Cultural evolution is faster than genetic also because it does not need generations to unfold. Looking again at the Roman frontier, we can see the cultural group selection in action in the rise and fall of charismatic leaders and their retinues, such as Arminius or Maroboduus. Through a process akin to mutation and recombination in genetics, each new warrior group will adopt somewhat different ways of organization and its members will internalize different norms. In the frontier situation, where the pressure of group selection is particularly heavy, groups will rapidly arise and dissolve. Only the most successful ones, those that hit by chance or design on the most advantageous combination of cultural elements, will survive. The cultural elements in question are not only those related to fighting prowess. Military bands that did not treat their women well never became functioning societies, and did not perpetuate themselves.

WHEN HUMANS EVOLVED THE ABILITY to cooperate with unrelated individuals, they relied on face-to-face interactions and memory to distinguish friends and acquaintances from the enemies or untrustworthy individuals in the group. There must have been an intense selection pressure for what science writer Malcolm Gladwell calls the “social channel capacity,” the ability to handle the complexities of living in large social groups. After all, to ensure cooperation you need to remember not only what each group member did to you, but also what they all did to each other. If Mary cheated Jane, she might

also cheat you. When Bob fell asleep on guard duty, but John did not shun him, as he was supposed to do, it means John is failing to cooperate in a collective sanctioning task. Making a society work is a complicated business.

But social channel capacity cannot be developed beyond a certain point—we cannot remember everyone on Earth, let alone what they have done to one another. As the size of the group increases, the number of relationships to remember explodes. If you belong to a group of 5 people, you only need to keep track of 10 separate relationships. If the group has 20 people, however, you need to remember 190 two-way relationships. The group size increased fourfold, but the number of relationships almost twenty-fold. Among the primates, humans live in the largest groups, and have the largest brains, but a limit is inescapable. "The figure of 150," estimates the British anthropologist Robin Dunbar, "seems to represent the maximum number of individuals with whom we can have a genuinely social relationship, the kind of relationship that goes with knowing who they are and how they relate to us. Putting it another way, it's the number of people you would not feel embarrassed about joining uninvited for a drink if you happened to bump into them in a bar." It turns out that the "magic number" of 150 is very close to the average size of villages in hunter-gatherer societies. Gladwell has cited many other examples of how the magic number crops up again and again—from military units to the maximum size of agricultural settlements allowed in the Hutterite sect, which originated in Central Europe in the sixteenth century, and moved to America in the twentieth.

Although our social channel capacity puts a limit on the number of people with whom we can maintain face-to-face relationships, group selection continued to favor social groups that could put out larger armies (or develop larger and thus more efficient economies) than their rivals. Evolution had to find another way for humans to distinguish between those with whom to cooperate and those who should be killed on the spot. And it did.

One aspect of human cognition that I have not yet touched on is our capacity for symbolic thinking. The distinctly human ability to invent and manipulate symbols was an important aspect of evolution of ultrasociality. In fact, as the Russian psychologist Lev Vygotsky (1896-1934) and his school argued, all higher forms of human cognition have social origins.

Think about the psychological difficulties involved in the idea of cooperating with a group. It is easy to imagine working together with a concrete person such as Bob or Jane, or a small group of people such as a family. (You can visualize it as people sitting around a table eating supper together.) When the group starts running into dozens of people, however, its "thingness" becomes blurred—its composition keeps changing with time, and its precise physical boundaries are unclear. How can it be made more concrete? In the process of evolution, humans developed the ability to represent such fuzzy entities with tangible objects. One example of a symbol representing a social group is the totem of American

Indians. As the great French sociologist Emile Durkheim recognized almost a century ago, the totem is "the symbol of the determined society called the clan. It is its flag; it is the sign by which each clan distinguishes itself from the others, the visible mark of its personality." Another example is the standard of a Roman legion, called the Eagle. The Eagle was a sacred emblem of the legion; for most intents and purposes, it was the legion. It was better to die to a man than allow the enemy to capture the Eagle.

As a result of our ability to use symbols, the idea of a social group ("us") has a peculiar grip on human imagination. Because of our psychological makeup, we tend to think of social groups, such as nations, as more real than they are "in reality." And because people treat nations as real, they behave accordingly, and, paradoxically, make them real.

To illustrate how we imagine nation as more real than "it really is," think of what images "America" evokes. (Feel free to substitute any country.) What is America? The Stars and Stripes, the national anthem, the White House and the Capitol, the Statue of Liberty, Uncle Sam, the president in the Oval Office, jeans, Coke, apple pie, the American Constitution, the Pledge of Allegiance, "the leader of the free world," "the Manifest Destiny," "the land of opportunity," the visual image of a U.S. map (or just the outline of the lower 48) ... and so on. These are all symbols that emphasize the "thingness" of America. The fact that a large minority of inhabitants of the country were born overseas and many do not even speak English very well, or that in recent elections half of the voters loathed the incumbent of the oval office, whereas most of the remainder loathed equally intensely the challenger for the office, is irrelevant. When people are inspired to die for their country, it does not matter that their country is imagined—the act of sacrifice is real enough. As Durkheim put it, "Social life, in all its aspects and in every period of history, is made possible only by a vast symbolism."

The capacity for symbolic thinking was the last great evolutionary innovation that made possible human ultrasociality. People now did not need to know personally another individual in order to determine whether to cooperate with him, or treat him as an enemy. Particularly good diagnostic features are religious observances and ritual actions. However, one could also look at the details of his clothing and ornamentation (including such permanent markings as tattoos or caste marks). One could listen to his dialect and observe his behavior.

"It's 1992 and I am sitting in a bar in Harare, Zimbabwe," wrote Patrick Neate in *Where You're At,* "when a guy walks in wearing a Lakers vest and Chipie jeans, his hair is neatly dreaded and he walks with a rolling ease of the B-boy swagger. He clocks my Karl Kanis and second pair of Air Jordans and comes straight over. 'Yo, my brother, wassup?'" Here were two complete strangers, one a Zimbabwean black kid, another a white kid from Chippenham, U.K., but they instantly recognized each other as being "us," members of the same hip-

hop subculture—from they way they dressed, the way they walked or even sat, the way they were "blunted." (I do not even pretend to understand what the last one means—but I am an outsider.)

Symbolic demarcation of the group made possible cooperating with strangers who were clearly marked as "one of us." Symbols made it possible to identify with very large groups of "us," groups that included many more people than the small circle any individual person could meet and get to know personally. In other words, the evolution of symbolic thinking enabled defining as "us" a group of any size.

Large nations of tens of millions of people did not, of course, arise in one fell swoop. The process was gradual and happened in stages. Several villages, threatened by a powerful enemy, could unite in a tribe and invent symbolic ways to mark and emphasize their union. In the next stage, several tribes could unite in a region-sized society; then regional societies into nations, and those, finally into supranational unions, such as large empires and whole civilizations. At each step, new symbols are invented to demarcate ethnic boundaries, or old symbols are stretched to encompass the larger society.

Traces of this stepwise increase in the size and complexity of societies can be detected by observing that people's ethnic identities have many nested layers, like Russian Matryoshka dolls. A person from Indiana (a "Hoosier") is also a Midwesterner, an American, and a member of the Western civilization. New Englanders ("Yankees") and Southerners ("Rebs") are other instantly recognizable subethnic identities. Regional identities can be quite strong. Many Texans take as much pride in the Lone Star state as in their country.

The United States is a modern country that arose as a result of torrents of immigrants entering the melting pot, so the nested nature of ethnicity is not as clear-cut here as in many more traditional societies. In many pastoral societies, by contrast, the nested, hierarchical organization is glaring. (Anthropologists call such societies "segmentary.") The basic principle of segmentary social organization is expressed in the Arab proverb "I against my brothers; I and my brothers against my cousins; I, my brothers, and my cousins against the world."

The Germanic peoples on the Roman frontier also had segmentary social organization. Several village communities together made up a tribe, such as the Chatti. Several tribes united into a tribal confederation, such as the Franks and the Alamanni. Finally, when the Franks constructed an empire, they united within it many Germanic tribal confederations. The presence of an imperial frontier was the key force driving this scaling up of the Germanic society. Tribes located far away from the threat and the opportunity of the Roman frontier would have little need to unite in a tribal confederation. On the Roman frontier, however, the fusion of tribes into a tribal confederation and then the

amalgamation of tribal confederations into an imperial confederation was a matter of life and death.

SUMMING UP THE MANY STRANDS of argument followed in this chapter, we started with the puzzle of human ultrasociality—our ability to combine into cooperating groups consisting of millions of individuals. Two key adaptations enabled the evolution of ultrasociality. The first one was the moralist strategy: Cooperate when enough members in the group are also cooperating, and punish those who do not cooperate. A band that had enough moralists to tip its collective behavior to the cooperative equilibrium outcompeted, or even exterminated, bands that failed to cooperate. The second adaptation, the human ability to use symbolic markers for defining cooperating groups, allowed evolution of sociality to break through the limits of face-to-face interactions. The scale of human societies increased in a series of steps, from the village and clan to the tribe and tribal confederation, then to the state, empire, and civilization.

As a new level of social complexity arose, the lower levels of organization were not completely eroded. As a result, people in general have coexisting identities, nested within each other. They can feel attachment and loyalty to their native town, their region, their country, and even to supranational organizations. The degree of identification with, and loyalty felt toward, an identity at any particular level can vary a lot. The attitudes of the modern Germans and the French toward their regional, national, and supranational identities are in stark contrast. The French can be quite attached to their regional identities, but they are first and foremost French. Their supranational identity as members of the European Union also takes a second seat to their Frenchness. By contrast, numerous sociological studies have shown that the post-war Germans identify primarily with their regional and supranational identities, and de-emphasize the national one. Thus, an inhabitant of southern Germany will think of himself or herself as a Bavarian and a European, tending to skip the intermediate level of German. Consequently, the Germans have been the most enthusiastic promoters of the European Union. This example also illustrates how the strength of identification with national identity can change with time. Up to and during World War II, of course, the Germans were fervently nationalistic—*"Deutschland über alles"*—but the shock of defeat and subsequent anti-Nazi propaganda discredited this identity for most of them. A similar de-emphasis of the identity associated with the state, but for a different reason, is observed among such ethnic minorities as the Catalans (many of whom would object strenuously to being called "Spanish") or the Catholic Irish in the United Kingdom. Such ethnic groups also tend to be ardent supporters of the European integration. In sum, different levels of social identity can evoke strong or weak feelings of loyalty, and the intensity of these feelings change as history unfolds.

Although the disposition to moralism or knavery might have a substantial genetic component, it is clear that temporal changes in the intensity of ethnic feeling, such as shifts in the main locus of ethnic feeling from regional to national level, and vice versa, must be culture-based. As noted previously in this chapter, cultural evolution can occur on a much faster time scale than changes in genetic frequencies. After moralists and symbolic thinkers evolved through the process of genetic evolution, the rise (and fall) of identification with and loyalty to higher-level identity could happen much more rapidly. Rapidly, that is, when compared to the glacial pace of genetic evolution. The empirical examples that we examined so far suggest that even cultural evolution needs centuries to produce societies capable of wide-scale cooperation.