

# Bringing in Darwin

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## Evolutionary Theory, Realism, and International Politics

Efforts to develop a foundation for scientific knowledge that would unite the natural and social sciences date to the classical Greeks. Given recent advances in genetics and evolutionary theory, this goal may be closer than ever.<sup>1</sup> The human genome project has generated much media attention as scientists reveal genetic causes of diseases and some aspects of human behavior. And although advances in evolutionary theory may have received less attention, they are no less significant. Edward O. Wilson, Roger Masters, and Albert Somit, among others, have led the way in using evolutionary theory and social science to produce a synthesis for understanding human behavior and social phenomena.<sup>2</sup> This synthesis posits that human behavior is simultaneously and inextricably a result of evolutionary and environmental causes. The social sciences, including the study of international politics, may build upon this scholarship.<sup>3</sup>

In this article I argue that evolutionary theory can improve the realist theory of international politics. Traditional realist arguments rest principally on one of two discrete ultimate causes, or intellectual foundations. The first is Reinhold Niebuhr's argument that humans are evil. The second is grounded in the work

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1. See Edward O. Wilson, *Consilience: The Unity of Knowledge* (New York: Knopf, 1998).

2. Wilson has pursued this goal since 1975, most recently in *ibid.*, pp. 8–14, 197–228; Roger D. Masters, "The Biological Nature of the State," *World Politics*, Vol. 35, No. 2 (January 1983), pp. 189–190; and Albert Somit, "Human Nature as the Central Issue in Political Philosophy," in Elliott White, ed., *Sociobiology and Human Politics* (Lexington, Mass.: D.C. Heath, 1981), pp. 167–180.

3. Ethology—the study of animal behavior—is significant as well, particularly the concept of evolutionary stable strategies, which was introduced by J. Maynard Smith and G.R. Price, "The Logic of Animal Conflict," *Nature*, November 2, 1973, pp. 15–18. This has informed such important scholarship as Robert Axelrod and William D. Hamilton's finding of the importance of reciprocation or tit-for-tat strategies for cooperation. See Axelrod and Hamilton, "The Evolution of Cooperation," *Science*, March 27, 1981, pp. 1390–1396; Robert Axelrod, *The Evolution of Cooperation* (New York: Basic Books, 1984), chap. 3; and John Maynard Smith, *Evolution and the Theory of Games* (New York: Cambridge University Press, 1982).

of Thomas Hobbes and Hans Morgenthau: Humans possess an innate *animus dominandi*, or drive to dominate. Both intellectual foundations are widely considered to be weak, however, because they rely either on a theological force or a metaphysical precept to explain state behavior. After the publication of Kenneth Waltz's *Theory of International Politics*, which anchored realism on the more scientific foundation of structuralism and the anarchic international system, few scholars found classical realism (hereafter realism) relevant for their scholarship.<sup>4</sup>

Evolutionary theory provides a stronger foundation for realism because it is based on science, not on theology or metaphysics. I use the theory to explain two human traits: egoism and domination. I submit that the egoistic and dominating behavior of individuals, which is commonly described as "realist," is a product of the evolutionary process.<sup>5</sup> I focus on these two traits because they are critical components of any realist argument in explaining international politics.<sup>6</sup>

I also argue that evolutionary theory may be applied not only to realism, but also to some of the central issues in international politics including the origins of war and ethnic conflict. An evolutionary perspective allows scholars of international politics to understand that war is not unique to humans, but is characteristic of other species in the animal kingdom as well. It also helps explain the role that war has played in human evolution, and why xenophobia and ethnocentrism are contributing causes of ethnic conflict.

These arguments are significant for two reasons. First, evolutionary theory offers a firm intellectual foundation for the realist argument that egoistic and dominating behavior is the result of human evolution. Realist scholars can use evolutionary theory to construct verifiable scientific explanations and thus expand realism's explanatory range,<sup>7</sup> which may help to reinvigorate realist

4. Kenneth N. Waltz, *Theory of International Politics* (Reading, Mass.: Addison-Wesley, 1979).

5. For the sake of simplicity, I discuss the "evolutionary process" even though four processes are actually at work: random genetic drift, migration, mutation, and natural selection. For discussion of these processes, see Theodosius Dobzhansky, *Genetics of the Evolutionary Process* (New York: Columbia University Press, 1970); John Maynard Smith, *The Theory of Evolution* (Harmondsworth, United Kingdom: Penguin, 1958); Ernst Mayr, *The Growth of Biological Thought: Diversity, Evolution, and Inheritance* (Cambridge, Mass.: Harvard University Press, 1982); and Elliott Sober, *Philosophy of Biology* (Boulder, Colo.: Westview, 1993). Sexual selection is sometimes considered a fifth mechanism of evolution. See Charles Darwin, *The Descent of Man, and Selection in Relation to Sex*, Vol. 1 (Princeton, N.J.: Princeton University Press, 1981[1871]), pp. 256–279.

6. I stress that they are critical components but not the totality of the realist argument. In addition, evolutionary theory can be used to explain other types of human behavior.

7. Both will improve the theory. On the desirability of constructing verifiable scientific explanations, see Gary King, Robert O. Keohane, and Sidney Verba, *Designing Social Inquiry: Scientific Inference in Qualitative Research* (Princeton, N.J.: Princeton University Press, 1994), p. 15. Stephen Van

scholarship.<sup>8</sup> Scholars who are attracted to realism but are not persuaded to ground their arguments based on *animus dominandi* or anarchy will find a sound scientific substructure in evolutionary theory.

Second, as the scholarship of Masters, Irenäus Eibl-Eibesfeldt, Wilson, and others demonstrates, evolutionary theory provides an anchor for the study of much of human behavior.<sup>9</sup> For example, Masters uses evolutionary theory to explain the origins of the state.<sup>10</sup> Somit and Steven Peterson argue that it provides a basis for specific forms of government.<sup>11</sup> This article is intended to build on their work by “bringing in Darwin,” that is, applying evolutionary theory to realism and international politics.

In the first section, I explain the ultimate causes of realism as presented by Niebuhr and Morgenthau.<sup>12</sup> In the second, I discuss evolutionary theory’s contribution to realism. Finally, I analyze the implications of evolutionary theory for understanding the origins of war and ethnic conflict.

### *The Traditional Ultimate Causes of Realism*

Like many theories in the natural and social sciences, realism lacks a common theoretical foundation. In cosmology, for example, scholars continue to debate the cause of the continued expansion of the universe 12–15 billion years after the Big Bang created it largely because they disagree about the extent to which physical forces other than gravity are at play. Paleontologists dispute whether dinosaurs were warm-blooded and whether their behavior is more closely related to that of modern reptiles or mammals. To understand why disciplines or theories that lack a common foundation can still be useful, scholars must dis-

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Evera argues that better theories have broad explanatory range. See Van Evera, *Guide to Methods for Students of Political Science* (Ithaca, N.Y.: Cornell University Press, 1997), p. 18.

8. Gideon Rose also does this by combining elements of realism and neorealism. Rose, “Neoclassical Realism and Theories of Foreign Policy,” *World Politics*, Vol. 51, No. 1 (October 1998), pp. 144–172.

9. Roger D. Masters, *The Nature of Politics* (New Haven, Conn.: Yale University Press, 1989); Irenäus Eibl-Eibesfeldt, *Human Ethology* (New York: Aldine de Gruyter, 1989); and Wilson, *Consilience*, pp. 8–14, 197–228. See also Richard D. Alexander, *The Biology of Moral Systems* (New York: Aldine de Gruyter, 1987); and Francis Fukuyama, *The Great Disruption: Human Nature and the Reconstitution of Social Order* (New York: Free Press, 1999).

10. Masters, “The Biological Nature of the State,” pp. 185–189.

11. Albert Somit and Steven A. Peterson, *Darwinism, Dominance, and Democracy: The Biological Bases of Authoritarianism* (Greenwich, Conn.: Praeger, 1997). See also Laura L. Betzig, *Despotism and Differential Reproduction: A Darwinian View of History* (New York: Aldine de Gruyter, 1986).

12. I do not critique these arguments here. Both theorists have been widely criticized, perhaps most perceptively by Kenneth N. Waltz, *Man, the State, and War: A Theoretical Analysis* (New York: Columbia University Press, 1959), pp. 26–39.

tinguish between ultimate and proximate causation. Ultimate causes are universal statements that explain proximate causes.<sup>13</sup> Proximate causes are deductively derivable from ultimate causes and focus on explanations of immediate occurrences. In general, a theory is better if its ultimate and proximate causes are testable.

Evolutionary theory seeks to understand the ultimate causes of behavior. In evolutionary theory, ultimate causal analysis explains why proximate mechanisms occur and why animals respond to them as they do. It does not describe behavior, but rather frames the parameters of a proximate causal explanation.<sup>14</sup> Proximate causal analysis seeks to explain, for example, why or how hormonal or stimulus-specific factors operate within an animal.<sup>15</sup> To understand why birds fly south for the winter, an ultimate causal explanation of bird migration would consider factors that contribute to fitness such as the availability of food, access to mates, and the presence of predators at both the indigenous and wintering areas. A proximate explanation would consider high sex hormone levels that are correlated with spring migrations, or changing environmental conditions to which birds are sensitive, such as fluctuations in temperature, rainfall, and barometric pressure.

Realists have traditionally argued that there are two ultimate causes of human behavior. The first, grounded in theology, is expressed by Niebuhr: Humans are evil. Human evil is the primary cause of human behavior, especially of the desire to dominate others. Humans possess "unlimited and demonic potencies of which animal life is innocent."<sup>16</sup> Evil manifests itself in sin, or the re-

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13. The distinction between ultimate and proximate causation is commonly made in biology. See Ernst Mayr, *Toward a New Philosophy of Biology: Observations of an Evolutionist* (Cambridge, Mass.: Harvard University Press, 1988), pp. 24–37. I base the distinction between universal and proximate causation on Mayr and Wesley Salmon's distinction between fundamental and derivative theories. A universal cause is a fundamental, lawlike sentence. It is general and adequately supported by empirical evidence. A proximate cause is derivable from fundamental theories. Wesley C. Salmon, *Four Decades of Scientific Explanation* (Minneapolis: University of Minnesota Press, 1989), pp. 18–20. Salmon's argument is based on Carl Hempel and Paul Oppenheim's distinction between fundamental laws and derivative laws. Hempel and Oppenheim, "Studies in the Logic of Explanation," *Philosophy of Science*, Vol. 15 (1948), pp. 135–148, reprinted in Carl G. Hempel, *Aspects of Scientific Explanation* (New York: Free Press, 1965), pp. 245–290, 267.

14. Most explanations of behavior or events often implicitly rely on ultimate and proximate causal analysis, although in most everyday explanations, proximate ones are sufficient.

15. As Wilson explains: "Proximate explanations answer the question of *how* biological phenomena work, usually at the cellular and molecular levels," whereas ultimate causes explain "*why* they work . . . the advantages the organism enjoys as a result of evolution that created the mechanisms in the first place." Wilson, *Consilience*, pp. 85–86 (emphasis in original).

16. Reinhold Niebuhr, *The Nature and Destiny of Man: A Christian Interpretation*, 2 vols. (New York: Charles Scribner's Sons, 1941, 1943), Vol. 1, p. 179.

fusal of humans to accept inherent limitations.<sup>17</sup> Furthermore, all human activity is tainted with a narcissistic self-love that, for Niebuhr, is the essence of evil.<sup>18</sup> Self-love or pride causes humans to seek power because “the ego does not feel secure and therefore grasps for more power in order to make itself secure. It does not regard itself as sufficiently significant or respected or feared and therefore seeks to enhance its position in nature and society.”<sup>19</sup>

The recognition that humans are finite creatures causes them to seek power: “Man is the only finite creature who knows that he is finite and he is therefore tempted to protest against his fate. One form which this protest takes is his imperialistic ambition, his effort to overcome his insignificance by subordinating other life to his individual or collective will.”<sup>20</sup>

The recognition of human sinfulness manifests itself in Niebuhr’s consideration of international politics. Pride and a desire for power exist not only among individuals, but also among states. And because national pride is capable of causing greater evil, it is especially dangerous.<sup>21</sup> Niebuhr argues that the traditional realist mechanism of stability, the balance of power, is the only force capable of bringing justice to the world. The balance of power is necessary because the “natural weakness of democracy as a form of government when dealing with foreign policy is aggravated by liberalism as the culture which has informed the life of democratic nations.”<sup>22</sup> As Niebuhr explains, “In this liberalism there is little understanding of the depth to which human malevolence may sink and the heights to which malignant power may rise.”<sup>23</sup>

The second ultimate cause of egoistic and dominating behavior is given by Morgenthau: Humans behave as they do because they possess an *animus dominandi*.<sup>24</sup> They seek power because human nature is fundamentally egoistic

17. *Ibid.*, pp. 178–179.

18. Reinhold Niebuhr, *Faith and History: A Comparison of Christian and Modern Views of History* (London: Nisbet, 1938), p. 9. See also Reinhold Niebuhr, *The Children of Light and the Children of Darkness: A Vindication of Democracy and a Critique of Its Traditional Defence* (New York: Charles Scribner’s Sons, 1944), p. 55.

19. Niebuhr, *Nature and Destiny of Man*, Vol. 1, p. 189.

20. Reinhold Niebuhr, *Christianity and Power Politics* (New York: Charles Scribner’s Sons, 1940), pp. 156–157. As Niebuhr observes, “All of his intellectual and cultural pursuits . . . become infected with the sin of pride. Man’s pride and will-to-power disturb the harmony of creation.” Niebuhr, *Nature and Destiny of Man*, Vol. 1, p. 179.

21. This is true even for a liberal democracy such as the United States. See Niebuhr, *Children of Light and the Children of Darkness*, pp. 20–21, 183–186. Waltz also makes this point in *Man, the State, and War*, pp. 18ff.

22. Niebuhr, *Christianity and Power Politics*, p. 26.

23. *Ibid.*, p. 47.

24. Hans Morgenthau, *Scientific Man vs. Power Politics* (Chicago: University of Chicago Press, 1946), p. 192. Classical realism contains many assumptions that are not addressed here, such as:

and malignant. Thus conflict and war occur because human nature is bad.<sup>25</sup> Thomas Hobbes provided the foundation for this second, secular, pillar of realist thought: Humans are ruled by an insatiable desire for power.<sup>26</sup> This lust for power has created a state of war in which humans live in reciprocal and permanent fear of violent death, and in which peace is always precarious.

According to Morgenthau, the "desire for power . . . concerns itself not with the individual's survival but with his position among his fellows once his survival has been secured. . . . His lust for power would be satisfied only if the last became an object of his domination, there being nobody above or beside him, that is, if he became like God."<sup>27</sup> So encompassing is this desire for power that the tendency to dominate "is an element of all human associations, from the family through fraternal and professional associations and local political organizations, to the state."<sup>28</sup>

Two types of behavior are the proximate causes of the realist argument: egoism and domination.<sup>29</sup> Egoism will cause an individual to place his interests before those of others, the interests of himself and his family before those of more distant relatives, and the interests of relatives before those of his community, state, and so on.<sup>30</sup> The desire to dominate, realists believe, is inherent and often leads to physical aggression against those who oppose one's objectives.

State leaders are expected to mirror this ordering by putting the interests of their state before those of others or of the world community, and by striving to dominate other states. Realists argue that only by possessing power can individuals attack and conquer others as well as deter and defend themselves from

States desire survival; states are the key actors in international politics; and the nature of international politics is inherently conflictive.

25. Demonstrating the brutality and prevalence of war in prehistoric times is Lawrence H. Keeley, *War before Civilization: The Myth of the Peaceful Savage* (New York: Oxford University Press, 1996). See also Carol R. Ember, "Myths about Hunter-Gatherers," *Ethnology*, Vol. 17, No. 4 (October 1978), pp. 439-448; and Harry H. Turney-High, *Primitive War: Its Practice and Concepts* (Columbia: University of South Carolina Press, 1949).

26. Thomas Hobbes, *Leviathan*, ed. C.B. Macpherson (Harmondsworth, United Kingdom: Penguin, 1985), chap. 11, p. 161.

27. Morgenthau, *Scientific Man vs. Power Politics*, p. 193.

28. Hans J. Morgenthau, *Politics among Nations: The Struggle for Power and Peace*, 5th rev. ed. (New York: Knopf, 1978), p. 37.

29. Here I am concerned only with the minimal essential traits of people necessary to make the realist argument. I do not claim that other traits are not used by realists, nor am I making any claims about what individual realists do or should do. It is only important to my argument that realists consider these traits significant.

30. Richard D. Alexander makes precisely this point in Alexander, *Darwinism and Human Affairs* (Seattle: University of Washington Press, 1979), Figure 4, p. 44. For a discussion of egoism, see Elliott Sober and David Sloan Wilson, *Unto Others: The Evolution and Psychology of Unselfish Behavior* (Cambridge, Mass.: Harvard University Press, 1998), p. 224.

attack. The principal result of this process is that balances of power will form and reform cyclically, producing both periods of stability and intense security competition in international politics.

### *Evolutionary Theory as the Ultimate Cause of Realism*

Contemporary evolutionary theorists offer excellent arguments for explaining some of the human behavior expected by realism. Particularly interesting are those in the subdiscipline of evolutionary theory known as sociobiology, the study of human behavior from the perspective of evolutionary theory.<sup>31</sup> Thus far, however, realists have not used evolutionary theory to place realism on a stronger foundation.<sup>32</sup> After briefly reviewing the evolutionary process, I discuss how it can explain the origins of egoism and domination and why it is a better ultimate cause of realist behavior than those put forth by Niebuhr and Morgenthau.<sup>33</sup>

#### THE PROCESS OF EVOLUTION

In evolutionary theory, *Homo sapiens*, or the anatomically modern human, is an animal, and like all animals behaves as he does as a result of evolution by natural selection.<sup>34</sup> The essence of evolution by natural selection is that most behavioral characteristics of a species evolve because they help the species survive and reproduce.<sup>35</sup> According to philosopher of biology Elliott Sober, there are

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31. Formally, sociobiology is a subdiscipline of evolutionary theory that applies the theory to the social behavior of animals, including *Homo sapiens*, in order to study how social behavior is shaped by natural selection. The *locus classicus* is Edward O. Wilson, *Sociobiology: A New Synthesis* (Cambridge, Mass.: Harvard University Press, 1975). Wilson defines it as "the systematic study of the biological basis of all social behavior." *Ibid.*, p. 4. Sober offers a broader definition: "a research program that seeks to use evolutionary theory to account for significant social, psychological, and behavioral characteristics in various species." Sober, *Philosophy of Biology*, p. 184.

32. In a broader context, the intellectual intercourse between social sciences and biology should be increased. Notable for their work at the nexus of biology and social science, in addition to the authors noted elsewhere, are Luigi Luca Cavalli-Sforza and Francesco Cavalli-Sforza, *The Great Human Diasporas: The History of Diversity and Evolution* (Reading, Mass.: Addison-Wesley, 1995); Peter A. Corning, "The Biological Bases of Behavior and Some Implications for Political Science," *World Politics*, Vol. 23, No. 3 (April 1971), pp. 321–370; Jared Diamond, *Guns, Germs, and Steel: The Fates of Human Societies* (New York: W.W. Norton, 1997); and Thomas C. Wiegale, ed., *Biology and the Social Sciences: An Emerging Revolution* (Boulder, Colo.: Westview, 1982).

33. While evolutionary theory can explain this behavior, the egoism or drive to dominate of any individual may result from other causes as well.

34. More precisely, human behavior is the result of the environment and genotype. The perspective begins with Charles Darwin's description of natural selection, the mechanism of evolution in Darwin, *On the Origin of Species by Means of Natural Selection* (Cambridge, Mass.: Harvard University Press, 1964[1859]).

35. "Those whose genes promote characteristics that are advantageous in the struggle to survive

three constituents of this process.<sup>36</sup> First, there must be genetic variation in the species. If all individuals are the same, then there is no basis for change. Gene frequencies, however, alter regularly through genetic drift, migration, mutation, and natural selection.<sup>37</sup> Thus for sexually reproducing species, only identical twins (or other monozygotic multiple births) are truly identical; all others possess differences. Second, genetic variation must improve what biologists term "fitness": A member of a species is fit if it is better able to survive and reproduce—hence the term "survival of the fittest."<sup>38</sup> These individuals will be better represented in the next generation than those less fit. Finally, there must be heritable variation in fitness: The characteristic must be passed from parent to offspring.<sup>39</sup>

According to evolutionary theory, human behavioral traits (the genetic causes of human behavior) evolve and genes that increase fitness spread through the population. By displaying these traits, an individual stands a better chance of surviving long enough to reproduce and of having her genes represented in the next generation. This is the essence of the basic model of evolutionary theory upon which realism may build.<sup>40</sup>

#### THE ORIGINS OF EGOISM

Evolutionary theory offers two sufficient explanations for the trait of egoism. The first is a classic Darwinian argument: In a hostile environment where resources are scarce and thus survival precarious, organisms typically satisfy their own physiological needs for food, shelter, and so on before assisting oth-

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and reproduce are rewarded through the transmission of their genes to the next generation." Phillip Kitcher, *Vaulting Ambition: Sociobiology and the Quest for Human Nature* (Cambridge, Mass.: MIT Press, 1985), p. 42.

36. Sober, *Philosophy of Biology*, p. 9.

37. Cavalli-Sforza and Cavalli-Sforza, *Great Human Diasporas*, pp. 92–104; Richard Dawkins, *The Extended Phenotype: The Gene as the Unit of Selection* (Oxford: W.H. Freeman, 1982), pp. 38–54; and Sober, *Philosophy of Biology*, pp. 18–19.

38. In addition, what is ultimately important is relative, not absolute, fitness. That is, it is not only the number of offspring one produces, but that one produces more than others. Sober and Wilson, *Unto Others*, p. 23. For excellent discussions of the complexities associated with fitness, see John Beatty, "Fitness: Theoretical Contexts," in Evelyn Fox Keller and Elisabeth A. Lloyd, eds., *Keywords in Evolutionary Biology* (Cambridge, Mass.: Harvard University Press, 1992), pp. 115–119; and Susan K. Mills and John Beatty, "The Propensity Interpretation of Fitness," in Elliott Sober, ed., *Conceptual Issues in Evolutionary Biology* (Cambridge, Mass.: MIT Press, 1994), pp. 3–23.

39. The ability of zebras to run fast is one example; on average, fast zebras tend to produce faster offspring. Of course, there are genetic, phenotypic, and environmental limits to the speed of zebras. Furthermore, as Sober notes, the environment may be especially important, particularly if offspring receive better nutrition. So there might be a purely environmental explanation for similarity between parental and offspring phenotypes. Sober, *Philosophy of Biology*, p. 11.

40. Evolutionary theory is concerned with ultimate causes of behavior rather than proximate causes.



ers.<sup>41</sup> In times of danger or great stress, an organism usually places its life—its survival—before that of other members of its group, be it pack, herd, or tribe. For these reasons, egoistic behavior contributes to fitness.

Evolutionary theorist Richard Dawkins's selfish gene theory provides the second sufficient explanation for egoism. A conceptual shift is required here because Dawkins's level of analysis is the gene, not the organism. As Dawkins explains, at one time there were no organisms, just chemicals in a primordial "soup."<sup>42</sup> At first, different types of molecules started forming by accident, including some that could reproduce by using the constituents of the soup—carbon, nitrogen, hydrogen, and oxygen. Because these constituents were in limited supply, molecules competed for them as they replicated. From this competition, the most efficient copy makers emerged. The process, however, was never perfect. Sometimes mistakes were made during replication, and occasionally these accidents resulted in more efficient replication or made some other contribution to fitness. One such mistake might have been the formation of a thin membrane that held the contents of the molecule together—a primitive cell. A second might have involved the division of the primitive cell into ever larger components, organs, and so on to create what Dawkins calls "survival machines." He explains, "The first survival machines probably consisted of nothing more than a protective coat. But making a living got steadily harder as new rivals arose with better and more effective survival machines. Survival machines got bigger and more elaborate, and the process was cumulative and progressive."<sup>43</sup> From a genetic perspective, there is no intentionality in this process, but it continued nonetheless because of evolution. Dawkins makes clear, however, that the interests of the gene and the organism need not coincide at different stages in an organism's life, particularly after reproduction.<sup>44</sup> In general, however, the selfishness of the gene increases its fitness, and so the behavior spreads.

#### THE ORIGINS OF DOMINATION

Evolutionary theory can also explain the trait of domination. In evolutionary theory, domination usually means that particular individuals in social groups have regular priority of access to resources in competitive situations. For most social mammals, a form of social organization called a "dominance hierarchy"

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41. Although, as I discuss below, inclusive fitness may modify this argument.

42. Richard Dawkins, *The Selfish Gene*, new ed. (Oxford: Oxford University Press, 1989), p. 258.

43. *Ibid.*, p. 19.

44. *Ibid.*, chap. 6.

operates most of the time.<sup>45</sup> The creation of a dominance hierarchy may be violent and is almost always competitive. A single leader, almost always male (the alpha male), leads the group. The ubiquity of this social ordering strongly suggests that such a pattern of organization contributes to fitness.

Two principal types of behavior are evident among social mammals in a dominance hierarchy: dominant and submissive. Dominant mammals have enhanced access to mates, food, and territory, thus increasing their chances of reproductive success.<sup>46</sup> Acquiring dominant status usually requires aggression. Dominance, however, is an unstable condition; to maintain it, dominant individuals must be willing to defend their privileged access to available resources as long as they are able. Ethologists Richard Wrangham and Dale Peterson explain why an individual animal vies for dominant status: "The motivation of a male chimpanzee who challenges another's rank is not that he foresees more matings or better food or a longer life."<sup>47</sup> Rather "those rewards explain why . . . selection has favored the desire for power, but the immediate reason he vies for status . . . is simply to dominate his peers."<sup>48</sup>

Dominant animals often assume behavior reflecting their status. For example, dominant wolves and rhesus monkeys hold their tails higher than do other members of their group in an effort to communicate dominance. A dominant animal that engages in such displays is better off if it can gain priority of access to resources without having to fight for it continuously.<sup>49</sup>

45. Social mammals are usually defined as those mammals that live in groups (such as packs, herds, and tribes) that cooperate to raise the young and defend the group from enemies, and in which there is overlap in the group between at least two generations.

46. Dorothy L. Cheney and Robert M. Seyfarth, *How Monkeys See the World: Inside the Mind of Another Species* (Chicago: University of Chicago Press, 1990), p. 35; Alexander H. Harcourt and Frans B.M. de Waal, eds., *Coalitions and Alliances in Humans and Other Animals* (Oxford: Oxford University Press, 1992); and de Waal, *Chimpanzee Politics: Power and Sex among Apes*, rev. ed. (Baltimore, Md.: Johns Hopkins University Press, 1998).

47. Richard Wrangham and Dale Peterson, *Demonic Males: Apes and the Origins of Human Violence* (Boston: Houghton Mifflin, 1996), p. 199.

48. *Ibid.*, p. 199. See also Konrad Lorenz, *On Aggression*, trans. Marjorie Kerr Wilson (New York: Harcourt, Brace, and World, 1966). Sociobiology is closely allied with ethology. Both disciplines pay close attention to the evolutionary history of species and the manner in which behavior (instinct in particular) adapts organisms to their environment. It differs from sociobiology because "ethology focuses on the details of individual behavior, including the activity of the nervous system and the effects of hormones; sociobiology concentrates on the most complex forms of social behavior and the organization of entire societies." Charles J. Lumsden and Edward O. Wilson, *Promethean Fire: Reflections on the Origin of Mind* (Cambridge, Mass.: Harvard University Press, 1983), p. 23.

49. David P. Barash, *Sociobiology and Behavior* (New York: Elsevier, 1977), p. 237. In this respect, animal behavior is like deterrence and coercion in international politics. Animals, like states, signal their intentions in efforts to deter and coerce. As Waltz notes, "Force is least visible where power is most fully and most adequately present." Waltz, *Theory of International Politics*, p. 185.

Submissive social mammals recognize what is permitted and forbidden given their place in the hierarchy. They often try to be as inconspicuous as possible. This behavior signals that the subordinate accepts its place in the dominance hierarchy and at least temporarily will make no effort to challenge the dominant animal.

Ethologists and sociobiologists argue that dominance hierarchies evolve because they aid defense against predators, promote the harvesting of resources, and reduce intragroup conflict.<sup>50</sup> A species that lives communally has two choices: either it accepts organization with some centralization of power, or it engages in perpetual conflict over scarce resources, which may result in serious injury and thus deprive the group of the benefits of a communal existence.<sup>51</sup> Ethological studies have confirmed that a hierarchical dominance system within a primate band minimizes overt aggression; aggression increases, however, when the alpha male is challenged.

The dominance hierarchy has had a profound effect on human evolution. As cognitive psychologist Denise Dellarosa Cummins argues, "The fundamental components of our reasoning architecture evolved in response to pressures to reason about dominance hierarchies, the social organization that characterizes most social mammals."<sup>52</sup> Her study and others have found that dominance hierarchies contribute to the evolution of the mind, which in turn contributes to fitness.

According to Cummins, submissive individuals have the ability to detect, exploit, and circumvent the constraints of domination. If an animal can take what it wants by force, it is sure to dominate the available resources—unless its subordinates are smart enough to outwit it. A subordinate must use other

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50. See James L. Boone, "Competition, Conflict, and the Development of Social Hierarchies," in Eric Alden Smith and Bruce Winterhalder, eds., *Evolutionary Ecology and Human Behavior* (New York: Aldine de Gruyter, 1992), pp. 301–337; Joseph Lopreato, *Human Nature and Biocultural Evolution* (Boston: Allen and Unwin, 1984), pp. 161–176; Donald L. McEachron and Darius Beer, "A Review of Selected Sociobiological Principles: Application to Hominid Evolution II. The Effects of Intergroup Conflict," *Journal of Social and Biological Structures*, Vol. 5, No. 2 (April 1982), pp. 121–139; K.E. Moyer, "The Biological Basis of Dominance and Aggression," in Diane McGuinness, ed., *Dominance, Aggression, and War* (New York: Paragon House, 1987), pp. 1–34; Wilson, *Sociobiology*, p. 287; and Fred H. Willhoite, Jr., "Primates and Political Authority," *American Political Science Review*, Vol. 70, No. 4 (December 1976), pp. 1110–1126. Stanley Milgram also notes the importance of what he terms "dominance structures." He argues that the "potential for obedience is prerequisite of . . . social organization." Milgram, *Obedience to Authority: An Experimental View* (New York: Harper and Row, 1974), p. 124.

51. In this respect, international politics resembles animal behavior. As an alpha male provides stability to the group, so too a hegemon in international politics may provide stability for lesser states both in the realm of international security and for international political economy.

52. Denise Dellarosa Cummins, "Social Norms and Other Minds," in Cummins and Colin Allen, eds., *The Evolution of Mind* (New York: Oxford University Press, 1998), p. 30.

strategies—deception, guile, appeasement, bartering, alliance formation, or friendship—to survive. Thus intelligence is particularly important to the survival of subordinates. “The evolution of mind emerges,” Cummins writes, “as a strategic arms race in which the weaponry is ever-increasing mental capacity to represent and manipulate internal representations of the minds of others.”<sup>53</sup>

From their studies of chimpanzee societies, ethologists have learned that the struggle for survival is best characterized as a struggle between those who are dominant and those seeking to outwit them (i.e., between recognizing an opponent’s intentions and hiding one’s own). The following example illustrates how a subordinate chimpanzee, Belle, who knows the location of hidden food, attempts to deceive Rock, who is dominant.

Belle accordingly stopped uncovering the food if Rock was close. She sat on it until Rock left. Rock, however, soon learned this, and when she sat in one place for more than a few seconds, he came over, shoved her aside, searched her sitting place, and got the food. Belle next stopped going all the way [to the food]. Rock, however, countered by steadily expanding the area of his search through the grass near where Belle had sat. Eventually, Belle sat farther and farther away, waiting until Rock looked in the opposite direction before she moved toward the food at all, and Rock in turn seemed to look away until Belle started to move somewhere. On some occasions Rock started to wander off, only to wheel around suddenly precisely as Belle was about to uncover some food. . . . On a few trials, she actually started off a trail by leading the group in the opposite direction from the food, and then, while Rock was engaged in his search, she doubled back rapidly and got some food.<sup>54</sup>

Despite the “arms race” described by Cummins to outwit a dominant individual, the subordinate members of the group continue to participate in the dominance hierarchy because doing so increases their chances of survival. As sociobiologist David Barash explains, if subordinates “are more fit by accepting . . . [subordinate] ranking than by refusing to participate, then some form of social dominance hierarchy will result.”<sup>55</sup>

Humans and other primates evolve a mental architecture to address the difficulties they encounter when in dominance hierarchies. As result of this, Wilson submits: “Human beings are absurdly easy to indoctrinate—they seek it.”<sup>56</sup> Three factors contribute to the ease of indoctrination. First, survival in a

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53. *Ibid.*, p. 37 (emphasis deleted). See also Alexander, *The Biology of Moral Systems*, pp. 114–117.

54. E.W. Menzel, “A Group of Chimpanzees in a One-Acre Field,” in A.M. Schrier and F. Stollnitz, eds., *Behavior of Nonhuman Primates* (New York: Academic Press, 1974), pp. 83–153. Quoted in Cummins, “Social Norms and Other Minds,” p. 37.

55. Barash, *Sociobiology and Behavior*, pp. 239–240.

56. Wilson, *Sociobiology*, p. 562 (emphasis in original). See also Lopreato, *Human Nature and*

hostile world dictates membership in a group and produces a fear of ostracism from it. Second, acceptance of, or conformity to, a particular status quo lowers the risk of conflict in a dominance hierarchy. Third, conformity helps keep groups together.<sup>57</sup> If group conformity becomes too weak, the group could fall apart and become extinct because of predation from one's own or another species.<sup>58</sup>

The consequences for the study of politics are great. Eibl-Eibesfeldt, Somit and Peterson, Wilson, and psychologist Donald Campbell, among others, suggest that humans readily give allegiance to the state, or embrace religion or ideologies such as liberalism or communism, because evolution has produced a need to belong to a dominance hierarchy.<sup>59</sup> An overview of human history provides context. Much of it is a record of threats of force or wars to gain territory and resources.<sup>60</sup> Political institutions, whether monarchies or aristocracies, and leaders such as Julius Caesar, Louis XIV, and Somali warlord Mohamed Farah Aidid typify dominance hierarchies—as do the modern state and its many institutions, including government bureaucracies and the military.<sup>61</sup>

These political examples are readily evident, but dominance hierarchies also have more subtle effects, for example, among the young and between the sexes. They help explain why people obey authority and intensify the significance of birth order. Research on children's social interactions has shown that children as young as three years organize themselves into dominance hierarchies. Stanley Milgram's famous psychological experiments show that ordinary citizens will obey those recognized as dominant even when they are using their power

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*Biocultural Evolution*, pp. 177–186; and Somit and Peterson, *Darwinism, Dominance, and Democracy*, pp. 77–84.

57. Donald T. Campbell, "On the Genetics of Altruism and the Counter-Hedonic Components in Human Culture," *Journal of Social Issues*, Vol. 28, No. 3 (1972), pp. 21–37.

58. Alexander, *Darwinism and Human Affairs*, p. 64.

59. Campbell, "On the Genetics of Altruism and the Counter-Hedonic Components in Human Culture"; Eibl-Eibesfeldt, *Human Ethology*; Frank Kemp Salter, "Indoctrination as Institutionalized Persuasion," in Irenäus Eibl-Eibesfeldt and Frank Kemp Salter, eds., *Indoctrinability, Ideology, and Warfare: Evolutionary Perspectives* (New York: Berghahn Books, 1998), pp. 421–452; and Wilson, *Sociobiology*, p. 562. *Masters in Nature of Politics* explores the biological foundation of political organization fully. Of course the specific form of the political organization, ideology, or religion is not informed by biology.

60. See Robert Bigelow, *The Dawn Warriors: Man's Evolution toward Peace* (Boston: Little, Brown, 1969).

61. Masters, *Nature of Politics*. See also Willhoite, "Primates and Political Authority," pp. 1118–1123. International politics may also be conceived of as a dominance hierarchy: The hegemon acts like the alpha male, and bids for hegemony resemble contests between alpha males defending their resources.

for clearly malevolent ends.<sup>62</sup> Frank Sulloway's analysis of birth order shows that dominance structures within the family influence personality, with first-born siblings seeking to maintain conformity, and later-borns, as subordinates, seeking to rebel against constraints.<sup>63</sup>

#### EVOLUTIONARY THEORY: A BETTER ULTIMATE CAUSE

Evolutionary theory provides a better foundation for realism than the theological or metaphysical arguments advanced by Niebuhr or Morgenthau for three reasons. First, it is superior as judged by the common metrics in philosophy of science developed by Carl Hempel and Karl Popper.<sup>64</sup> Evolutionary theory meets all of Hempel's criteria of the deductive-nomological (D-N) model of scientific explanation, unlike Niebuhr's evil or Morgenthau's *animus dominandi*.<sup>65</sup> Measured by Popper's criteria—developed in his theory of critical rationalism—evolutionary theory is also superior because it is falsifiable.<sup>66</sup> That is,

62. Milgram acknowledges the importance of the evolutionary process for obedience: "We are born with a *potential* for obedience, which then interacts with the influence of society to produce the obedient man." The capacity for obedience, he argues, is like the capacity for language where mental structures and a social milieu must be present. "In explaining the causes of obedience, we need to look both at the inborn structures and . . . social influences. . . . The proportion of influence exerted by each is a moot point. From the standpoint of evolutionary survival, all that matters is that we end up with organisms that can function in hierarchies." Milgram, *Obedience to Authority*, p. 125 (emphasis in original).

63. Frank J. Sulloway, *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives* (New York: Pantheon, 1996).

64. These are common standards but certainly not the only ones; others include those developed by Roy Bhaskar, Thomas Kuhn, and Imre Lakatos. Because the D-N model and Popper's falsification are commonly accepted, I discuss those. If one of these alternative standards were used, it would not affect the result, so I do not consider them.

65. More formally, the D-N model requires that the ultimate cause (the explanans) comprises statements of the antecedent conditions, *C*, and general laws such as laws of nature *L*. The explanandum, *E*, is the description of whatever is being explained, predicted or postdicted. Also, *E* must follow deductively from *C* and *L*.

Evolutionary theory provides a better ultimate causal foundation according to the D-N model because it tightly fits this model. It presents a theory of how nature evolves; specific evidence about how early primates and humans lived and continue to do so is widely known. Proximate causes of human behavior are deducible from it. Thus evolutionary theory provides an adequate causal explanation for realism because the explanans logically produces, provided the antecedent facts, the proximate causes (explanandum)—egoism and domination. See Carl G. Hempel, *Philosophy of Natural Science* (Englewood Cliffs, N.J.: Prentice-Hall, 1966), pp. 49–54; and Hempel, *Aspects of Scientific Explanation*, pp. 174, 232–233, 247–249.

66. The essence of Popper's metric is that corroboration of general theory is not possible. What scientists do is not to verify laws or theories but to falsify them. Evolutionary theory is falsifiable. That is, the conditions under which the theory would be disproved are derivable from the fundamental theory, as is the empirical evidence that would show it to be false. This is not the case for evil or *animus dominandi*. Karl R. Popper, *The Logic of Scientific Discovery* (London: Hutchinson, 1959), pp. 40–42, 78–92, 419.

scholars know what evidence would not verify the theory.<sup>67</sup> Niebuhr's and Morgenthau's ultimate causes are noumenal (i.e., outside the realm of scientific investigation). Second, evolutionary theory offers a widely accepted scientific explanation of human evolution, thus giving realism the scientific foundation it has lacked.

Third, realists can use evolutionary theory to advance arguments supporting offensive realism without depending on the anarchic international system. Offensive realists argue that states seek to maximize power because competition in the international system to achieve security compels them to do so.<sup>68</sup> Realism based on evolutionary theory reaches the same conclusion, but the causal mechanism is at the first image (the individual) rather than the third image (the international system). State decisionmakers are egoistic and strive to dominate others. In international politics they do so by maximizing state power.<sup>69</sup> Focused, empirical testing is required to determine which insights an offensive realism based on evolutionary theory provides. This in turn may inform explanations of why state leaders choose to expand and why they are often able to generate popular support for expansion with relative ease, or why external or internal threats have been such powerful motivators in building national solidarity and mobilizing a society's resources.

### *Implications for International Politics*

Scholars of international politics may use evolutionary theory to generate new understanding of important issues in international politics, such as the origins

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67. Popper himself made the charge that evolutionary theory was "not a testable scientific theory." Karl R. Popper, "Intellectual Autobiography," in Paul Arthur Schilpp, ed., *The Philosophy of Karl Popper*, Vol. 1 (La Salle, Ill.: Open Court, 1974), pp. 3–181, 134; and Popper, *Objective Knowledge*, rev. ed. (Oxford: Clarendon, 1979), pp. 256–280. Popper's argument is incorrect, however. Evolutionary theory is a testable scientific theory that possesses many falsifiable claims. See Mills and Beatty, "The Propensity Interpretation of Fitness," p. 9; M. Ruse, "Confirmation and Falsification of Theories in Evolution," *Scientia*, Vol. 104, Nos. 7–8 (1969), pp. 329–357; and Sober, *Philosophy of Biology*, p. 47.

68. The leading proponent of offensive realism is John J. Mearsheimer. See Mearsheimer, "The False Promise of International Institutions," *International Security*, Vol. 19, No. 3 (Winter 1994/95), pp. 5–49; and Mearsheimer, *Great Power Behavior* (New York: W.W. Norton, forthcoming). See also Christopher Layne, *The Peace of Illusions: International Relations Theory and American Grand Strategy in the Post-Cold War Era* (Ithaca, N.Y.: Cornell University Press, forthcoming). For an analysis of offensive and defensive realism, see Sean M. Lynn-Jones, "Realism and America's Rise: A Review Essay," *International Security*, Vol. 23, No. 2 (Fall 1998), pp. 157–182.

69. This explanation should not be viewed as an alternative to John Mearsheimer's offensive realism, but rather may be a complement to it. Either explanation may be sufficient to explain state behavior.

of war and ethnic conflict.<sup>70</sup> Evolutionary theory suggests why some humans organize attacks and why others organize to defend against such attacks. It also explains why suspicion of strangers contributes to fitness in the course of human evolution.

#### IMPLICATIONS FOR WARFARE

War is a phenomenon that has been usefully studied from multiple, often interdisciplinary, perspectives—psychological, regime type, and systemic, among others.<sup>71</sup> Although the causes of modern war are often complex, its prevalence throughout human history suggests that it is not caused principally by modern developments, such as imperialism or militarism, although these no doubt contribute to the scope, if not necessarily the intensity, of conflict.<sup>72</sup>

The human capacity for aggression and warfare has been widely studied by eminent psychologists such as Sigmund Freud and Erich Fromm. Freud interpreted aggressive human behavior as the outcome of a drive that constantly seeks release.<sup>73</sup> For Freud, war results from many motives, “some of which are openly declared and others which are never mentioned,” but “a lust for aggression and destruction is certainly among them.”<sup>74</sup> Building on Freud’s work, Fromm argued that humans are subject to a unique death instinct that leads to pathological forms of aggression beyond those found in other animals.<sup>75</sup>

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70. I examine each in turn, but my intent here is not to provide a comprehensive analysis, but rather to suggest how evolutionary theory may be used to generate new insights into traditional areas of study such as the causes of war and ethnic conflict.

71. The classic studies of war remain Geoffrey Blainey, *The Causes of War*, 3d ed. (New York: Free Press, 1988); and Quincy Wright, *A Study of War*, 2d ed. (Chicago: University of Chicago Press, 1965). Stephen Van Evera’s *The Causes of War: Power and the Roots of Conflict* (Ithaca, N.Y.: Cornell University Press, 1999) is as ambitious and thoughtful as these earlier works.

72. Studies of war in the ancient world reveal that it was absolute war for those populations involved, and often included massacres of surviving males. So warfare in the past could be no less total than it is today, although clearly modern technology makes it easier to kill more people more efficiently. As Thomas C. Schelling observed, “Against defenseless people there is not much that nuclear weapons can do that cannot be done with an ice pick.” Schelling, *Arms and Influence* (New Haven, Conn.: Yale University Press, 1966), p. 19.

73. For Freud, a desire to dominate and to aggress is a result of two diametrically opposed instincts: the life instinct (or life force, *Eros*) and the death instinct (sometimes referred to as *Thanatos*). Sigmund Freud, *The Ego and the Id*, trans. Joan Riviere (New York: W.W. Norton, 1962).

74. Sigmund Freud, “Why War?” in Melvin Small and J. David Singer, eds., *International War: An Anthology* (Homewood, Ill.: Dorsey Press, 1985), p. 162. Freud’s idea may be usefully compared with the reasons Niall Ferguson provides in his explanation of why soldiers fought in the Great War. Ferguson, *The Pity of War: Explaining World War I* (New York: Basic Books, 1999), pp. 339–366.

75. Erich Fromm, *The Anatomy of Human Destructiveness* (London: Jonathan Cape, 1974). For a thoughtful study of aggression from the perspective of evolutionary psychology, see David M.



An evolutionary perspective on war improves upon the insights of Freud and Fromm, because it explains the origin of war without depending on a “lust” for destruction as a causal mechanism. Evolutionary theory gives students of war a perspective not provided by psychological or systemic approaches and offers three important insights. First, warfare is not uniquely human. Second, although it may seem paradoxical, evolutionary theory explains how warfare contributes to fitness. Third, evolutionary theory explains the role war plays in creating human societies.

WARFARE IN THE ANIMAL KINGDOM. Fromm’s supposition that only humans are capable of some forms of aggression is correct, but it is perhaps only in this that humans are unique in the animal kingdom. Ethologists and sociobiologists agree that although humans may be predisposed to aggressiveness, they are far from being the most violent animal or the only one that wages war. Studies of numerous animals, including hyenas, lions, and langur monkeys, disclose that individuals engage in lethal fighting, infanticide, and even cannibalism much more frequently than do humans.<sup>76</sup> As Wilson has documented in his study of insect societies, “alongside ants, which conduct assassinations, skirmishes, and pitched battles as routine business, men are all but tranquilized pacifists.”<sup>77</sup> He argues, in fact, that an unbiased Martian observer might conclude that *Homo sapiens* is rather peaceful when compared to other species.<sup>78</sup>

In perhaps the most famous of all ethological studies, Jane Goodall observed that aggression is part of chimpanzee behavior. In the course of her studies, she watched not only violence associated with the struggle for male dominance but also much intercommunal violence, including attacks, murder, and a four-year war between rival communities.<sup>79</sup> Although many species are violent, at

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Buss and Todd K. Shackelford, “Human Aggression in Evolutionary Psychological Perspective,” *Clinical Psychological Review*, Vol. 17, No. 6 (1997), pp. 605–619.

76. Edward O. Wilson, *On Human Nature* (Cambridge, Mass.: Harvard University Press, 1998), pp. 103–104. For a discussion of infanticide among primates, including humans, see Michael P. Ghiglieri, *The Dark Side of Man: Tracing the Origins of Male Violence* (Reading, Mass.: Perseus Books, 1999), pp. 129–138; and Glenn Hausfater and Sarah Blaffer Hrdy, eds., *Infanticide: Comparative and Evolutionary Perspectives* (Hawthorne, N.Y.: Aldine de Gruyter, 1984).

77. Wilson, *On Human Nature*, p. 104.

78. Wilson, *Sociobiology*, p. 247.

79. Jane Goodall, *Through a Window: My Thirty Years with the Chimpanzees of Gombe* (Boston: Houghton Mifflin, 1990), pp. 75–84, 98–111; and Goodall, *The Chimpanzees of Gombe: Patterns of Behavior* (Cambridge, Mass.: Harvard University Press, 1986), pp. 313–356, 503–534. She notes, “If they had had firearms and had been taught to use them, I suspect they would have used them to kill.” *Ibid.*, p. 530.

this time we know that only some social insects, chimpanzees, and humans wage war (i.e., organized violence conducted to get others to yield to the desire of the attacking group).<sup>80</sup>

WARFARE AND FITNESS. For humans, there are two sufficient explanations for war: inclusive fitness and group selection. William Hamilton's inclusive fitness theory (also called kin selection) suggests that reproductive success is measured not only in terms of individual animals but also in terms of their relatives.<sup>81</sup> Masters summarizes how inclusive fitness modifies traditional Darwinian evolutionary theory: "natural selection favors the ability of individuals to transmit their genes to posterity. . . . however, an organism's reproductive success can sometimes be furthered by assisting others, instead of by mating."<sup>82</sup> Thus understood, an individual's self-interest can be served by assisting genetically related individuals.<sup>83</sup>

Evolutionary theory suggests that groups may go to war to increase inclusive fitness.<sup>84</sup> Doing so is logical for offensive and defensive reasons. A group becomes more fit if it can successfully attack to take the resources of others.<sup>85</sup>

Goodall's findings have been confirmed for chimpanzees and other primates. See Ghiglieri, *Dark Side of Man*, pp. 165–166; Junichiro Itani, "Intraspecific Killing among Non-Human Primates," *Journal of Social and Biological Structures*, Vol. 5, No. 4 (1982), pp. 361–368; Frans de Waal, *Peacemaking among Primates* (Cambridge, Mass.: Harvard University Press, 1989), pp. 61–78; and Wrangham and Peterson, *Demonic Males*, pp. 49–62, 127–152.

80. This definition of warfare is informed by evolutionary theory and permits the recognition that warfare contributed to fitness for certain species by yielding, among other factors, more resources for survival before it was, in Clausewitz's famous observation, conducted for political ends. As I explain below, both inclusive fitness and group selection can explain how warfare contributes to fitness. On warfare for insect societies, see Edward O. Wilson, *The Insect Societies* (Cambridge, Mass.: Belknap Press of Harvard University Press, 1971), pp. 447–452; for chimpanzees, see Goodall, *The Chimpanzees of Gombe*, pp. 530–534.

81. W.D. Hamilton, "The Genetical Evolution of Social Behavior. I," and Hamilton, "The Genetical Evolution of Social Behavior. II," both in *Journal of Theoretical Biology*, Vol. 7, No. 1 (July 1964), pp. 1–16 and pp. 17–52, respectively. John Maynard Smith terms the concept kin selection in his "Group Selection and Kin Selection," *Nature*, March 14, 1964, pp. 1145–1147.

82. Masters, "The Biological Nature of the State," p. 165.

83. Humans "should be selected to show altruism toward others in direct proportion to how closely related they are to us genetically. . . . We should be willing to suffer greater risks in aiding individuals who are more closely related and should withhold aid to more distantly related individuals. . . . Similarly, we should require that a distant relative be in greater need . . . in order for us to render the same assistance that we would dispense to a closer relative." Barash, *Sociobiology and Behavior*, p. 309.

84. For excellent studies of inclusive fitness as a cause of war, see R. Paul Shaw and Yuwa Wong, "Ethnic Mobilization and the Seeds of Warfare: An Evolutionary Perspective," *International Studies Quarterly*, Vol. 31, No. 1 (March 1987), pp. 5–31; and Shaw and Wong, *Genetic Seeds of Warfare: Evolution, Nationalism, and Patriotism* (Boston: Unwin Hyman, 1989).

85. A resource is any material substance that has the potential to increase survivability or fecundity of the population.

Also, it must be able to wage a defensive war when competitors threaten its resources.<sup>86</sup> Evolutionary theorist William Durham argues that intergroup aggression develops as a behavioral adaptation to conditions of competition for resources.<sup>87</sup> War is one means by which individuals “may improve the material conditions of their lives and thereby increase their ability to survive and reproduce.”<sup>88</sup> According to Durham’s research, a group can expand its resource base by aggressively seizing resources from other groups. Pressure might be particularly acute if population size is increasing faster than resources.

Ethnographer Andrew Vayda’s classic study of the Iban of Borneo and the Maori of New Zealand is instructive here. According to Vayda, the Iban case “shows the warlike extension of territory as a means whereby a group can avoid experiencing any very great privations due to the pressure of population upon available resources.”<sup>89</sup> For the Maori, conquest of neighboring groups was easier than expanding into new areas to cultivate resources: “If the time and effort required for clearing new virgin land were considerably more than were necessary for . . . conquest and the preparation of previously used land for cultivation, it follows that territorial conquests, such as some of those recorded in Maori traditional history, would have added more efficiently to the prosperity of particular groups than would peaceful dispersion.”<sup>90</sup>

Wilson’s explanation of the origins and continuation of warfare dovetails with Durham’s argument and Vayda’s ethnography. According to Wilson, warfare may have begun when one group of early humans considered “the significance of adjacent social groups and [how] to deal with them in an intelligent, organized fashion. A band might then dispose of a neighboring band, appropriate its territory, and increase its own genetic representation in the

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86. I assume that aggression is logical if it does not produce a decrease in the fitness of the group. If it did—if the relative power, the size, strength, and armament, was too great—then fleeing or bandwagoning would be rational.

87. William H. Durham, “Resource Competition and Human Aggression. Part 1, A Review of Primitive War,” *Quarterly Review of Biology*, Vol. 51, No. 3 (September 1976), pp. 385–415; and Carol R. Ember and Melvin Ember, “Resource Unpredictability, Mistrust, and War,” *Journal of Conflict Resolution*, Vol. 36, No. 2 (June 1992), pp. 242–262.

88. Durham, “Resource Competition and Human Aggression. Part I,” p. 411.

89. Andrew P. Vayda, “Expansion and Warfare among Swidden Agriculturalists,” *American Anthropologist*, Vol. 63, No. 2 (April 1961), p. 354 (emphasis in original). Vayda’s analysis is further developed in *War in Ecological Perspective: Persistence, Change, and Adaptive Processes in Three Oceanian Societies* (New York: Plenum Press, 1976), pp. 43–74. Noting the frequency of warfare among hunter-gatherer tribes is Ember, “Myths about Hunter-Gatherers,” pp. 439–448. These tribes, and others such as the Mae Enga, Mendi, and Maring of Papua New Guinea and Irian Jaya, are particularly valuable evidence because good ethnographic studies have been conducted, the tribes had little or no contact with colonial administration, and all are prestate societies; thus they are characteristic of the great majority of human history.

90. Vayda, “Expansion and Warfare among Swidden Agriculturalists,” p. 348.

metapopulation.<sup>91</sup> Furthermore, this band would retain the memory of the event and by repeating it would increase its control of resources.<sup>92</sup> The victories of the original band “might propel the spread of the genes through the genetic constitution of the metapopulation. Once begun, such a mutual reinforcement could be irreversible.”<sup>93</sup>

The second argument is that war evolved through a process of group selection that favors the self-sacrificing tendencies of some warriors.<sup>94</sup> This may seem curious, but according to some evolutionary theorists, altruistic or self-sacrificing attributes can evolve through natural selection even though they may appear to cause more individual costs than benefits.<sup>95</sup> From a strictly evolutionary (individual selection) or inclusive fitness perspective, individuals from one tribe may be willing to fight individuals from other tribes for the sake of small bands of relatives in which humans have lived through most of their evolutionary history. Fighting for the tribe, either aggressing or defending, would be fighting to preserve family and the warrior’s genes. But individuals, in general, should not fight absent these circumstances.

Evolutionary theorist David Sloan Wilson’s argument for group selection suggests why individuals would choose self-sacrifice. According to Wilson, group selection is the component of natural selection that operates on the differential productivity of local populations within a global population.<sup>96</sup> That is, individual selection favors traits that maximize fitness within single groups, but group selection favors traits that maximize the relative fitness of groups.<sup>97</sup>

As human groups grew to include more distant relatives and unrelated individuals, wars to aggress and to defend the population were still necessary—warriors were still required. Some of these individuals were willing to sacrifice more for the group. But for this to happen, four conditions were needed: (1) there had to be more than one group; (2) there had to be variance among

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91. Wilson, *Sociobiology*, p. 573.

92. *Ibid.*

93. *Ibid.*

94. Group and individual selection are not necessarily incompatible; both may be operative in a population simultaneously. Group selection was largely developed by Ronald A. Fisher and V.C. Wynne-Edwards. See Fisher, *The Genetical Theory of Natural Selection* (Oxford: Clarendon, 1930); and Wynne-Edwards, *Animal Dispersion in Relation to Social Behaviour* (Edinburgh: Oliver and Boyd, 1962).

95. Classic studies are Robert L. Trivers, “The Evolution of Reciprocal Altruism,” *Quarterly Review of Biology*, Vol. 46, No. 1 (March 1971), pp. 35–57; and David Sloan Wilson, *The Natural Selection of Populations and Communities* (Menlo Park, Calif.: Benjamin/Cummings, 1980).

96. Wilson, *Natural Selection of Populations and Communities*, p. 45.

97. As Sober and Wilson submit, “Altruism is maladaptive with respect to individual selection but adaptive with respect to group selection.” Sober and Wilson, *Unto Others*, p. 27.

groups for a particular trait, so some groups had to have more altruists than others; (3) there had to be a direct relationship between the proportion of altruists in the group and the offspring of the group; and (4) the altruists had to reproduce with other groups.<sup>98</sup> In conflict, the group that prevailed could conquer others because it had more warriors. It had more warriors because the population had more altruists. Because the warriors reproduced, the “warrior” genetic type continued, though it may have declined relative to the other members of the group during episodes of warfare. Thus group selection explains how altruism contributes to warfare.<sup>99</sup>

While the origin of warfare is informed by evolutionary theory, warfare itself has multiple forms and is greatly influenced by culture and the international system. To understand why, one must move from ultimate causes of warfare to proximate causes. E.O. Wilson explains, “The particular forms of organized violence are not inherited. No genes differentiate . . . headhunting from cannibalism, the duel of champions from genocide.”<sup>100</sup> Thus each culture gives a specific form to warfare—from the Greek phalanx to the precision weaponry of information warfare—and the competitive pressure of the international system forces socialization.<sup>101</sup> And of course the effect of culture (or more broadly the social environment) is not limited to the form warfare takes; culture influences the suppression or exacerbation of conflict.

WAR AND THE CREATION OF SOCIETIES. Evolutionary theory can explain the key role of war in the creation of societies. Evolutionary theorist Richard Alexander proposes the “balance of power” theory of human social organization.<sup>102</sup> He argues that human society originated in three stages: (1) small groups developed early in human history for protection against predators; (2) over time these groups began killing large animals for food; and (3) increasingly large bands had to stay together to counter the threat posed by other groups of humans. For Alexander, the threat of war and the need for protection through balancing the power of proximate groups gave rise to human society.

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98. The four criteria of group selection are drawn from *ibid.*, p. 26.

99. Also noting the relationship between group selection and warfare are Peter A. Corning, “An Evolutionary Paradigm for the Study of Human Aggression,” in Martin A. Nettle, R. Dale Givens, and Anderson Nettle, eds., *War, Its Causes and Correlates* (The Hague: Mouton, 1975), pp. 359–387; Irenäus Eibl-Eibesfeldt, “Us and the Others,” in Eibl-Eibesfeldt and Salter, *Indoctrinability, Ideology, and Warfare*, pp. 21–53; Eibl-Eibesfeldt, “Warfare, Man’s Indoctrinability, and Group Selection,” *Zeitschrift für Tierpsychologie*, Vol. 60, No. 3 (1982), pp. 177–198; and Joseph Soltis, Robert Boyd, and Peter J. Richerson, “Can Group-Functional Behaviors Evolve by Cultural Group Selection?” *Current Anthropology*, Vol. 36, No. 3 (June 1995), pp. 473–483.

100. Wilson, *On Human Nature*, p. 114.

101. Waltz, *Theory of International Politics*, pp. 74–77, 127–128.

102. Alexander, *Darwinism and Human Affairs*, pp. 222–223.

Physiologist Jared Diamond provides a similar explanation of this process: "The amalgamation of smaller units into larger ones has often been documented historically or archaeologically. Contrary to Rousseau, such amalgamations never occur by a process of unthreatened little societies freely deciding to merge."<sup>103</sup> Rather such amalgamation occurs in either of two ways: "by merger under the threat of external force, or by actual conquest."<sup>104</sup>

Population density is critical for understanding why the external threat from neighboring groups increased around 13,000 years ago. Diamond argues that where population densities are low—for example, in hunter-gather societies—groups may migrate away from the external threat posed by others, as they did in the Amazon, New Guinea, and North America.<sup>105</sup> Hunter-gathers are better able to move around because they are less tied to a specific territory. Where densities are moderate, as in simple agricultural, tribal societies, there are fewer places for survivors to flee. Furthermore, Diamond submits, with little food surplus in these societies, the victors have little use for the survivors. Thus began the pattern that defined war in the ancient world: Men are killed, women and children become captives, and territory is occupied.<sup>106</sup> Finally, where population densities are high, the survivors have nowhere to go, but the victors can more effectively exploit the defeated by making them pay tribute or absorbing them into their society.

According to Diamond, an example of a tribe that merged with another tribe under external force is the Cherokee Indian confederation that formed in the eighteenth century to counter increasing pressure from white settlers.<sup>107</sup> Later, facing similar pressure, the Sioux adopted the same response. The United States also faced pressure from external foes—the British—as well as internal foes, as Shays's Rebellion illustrated. Both were instrumental in replacing the Articles of Confederation with the Constitution, which provides for a strong central government to deal with enemies both foreign and domestic. In the

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103. Diamond, *Guns, Germs, and Steel*, p. 289.

104. *Ibid.*, p. 289. See also Robert Bigelow, "The Role of Competition and Cooperation in Human Evolution," in Nettleship, Dalegivens, and Nettleship, *War, Its Causes and Correlates*, pp. 235–258; and Keeley, *War before Civilization*.

105. Diamond, *Guns, Germs, and Steel*, pp. 291–292; and Robert L. Carneiro, "A Theory of the Origin of the State," *Science*, August 21, 1970, pp. 734–737.

106. Wilson calls attention to this pattern when he recalls Moses' instructions on the occasion of the victory over the Midianites: "Now kill every male dependent, and kill every woman who has had intercourse with a man, but spare for yourselves every woman among them who has not had intercourse." Numbers 31:7,17,18. Wilson, *Sociobiology*, p. 573. Wilson notes that aggression and genetic usurpation occurs among other primates as well.

107. Diamond, *Guns, Germs, and Steel*, pp. 289–290.

nineteenth century, despite the strong opposition of some Germans, Germany unified in response to increasing threats from larger, unified states around it.

Diamond's second cause of population aggregation (i.e., by conquest) is better studied.<sup>108</sup> Charles Tilly, perhaps the foremost contemporary scholar of war's effect on state formation, succinctly observed, "War made the state, and the state made war."<sup>109</sup> But as Robert Carneiro has demonstrated, war created complex societies long before European state formation in the sixteenth and seventeenth centuries, and in non-European cultures as well.<sup>110</sup> States created by conquest include the Zulu state in southeastern Africa, the Ashanti state of west Africa, the Aztec and Inca empires, as well as Rome and the Macedonian Empire under Alexander.

#### IMPLICATIONS FOR THE ULTIMATE CAUSES OF ETHNIC CONFLICT

The frequency of ethnic conflict since the end of the Cold War, including conflicts in Bosnia, Chechnya, Kashmir, Kosovo, Rwanda, Sri Lanka, and Turkey, has led to considerable research into its causes.<sup>111</sup> Clearly the slaughter of 800,000–1 million Tutsis and moderate Hutus in Rwanda, and the widespread ethnic cleansing in the former Yugoslavia, demonstrate the need to understand ethnic conflict. Referring to the Serb ethnic cleansing of Kosovo in 1999, President Bill Clinton said that a bright future for humanity is threatened "by the oldest problem of human society: our tendency to fear and dehumanize people who are different from ourselves."<sup>112</sup> This comment is understandable if it is perceived as a justification to a liberal society of NATO's actions against Serbia. Considered from the perspective of evolutionary theory, however, Clinton's words seem to suggest that only if humans stop being human can they enjoy the bright future he envisions.

Clinton has identified the problem. Xenophobia—the fear of strangers—and ethnocentrism—the belief in the superiority or preference for members of one's own ethnic group—exist among almost all peoples, and both contribute

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108. For classic considerations, see Carneiro, "A Theory of the Origin of the State"; and Franz Oppenheimer, *The State*, trans. John Gitterman (New York: Free Life Editions, 1975).

109. Charles Tilly, "Reflections on the History of European State-Making," in Tilly, ed., *The Formation of National States in Western Europe* (Princeton, N.J.: Princeton University Press, 1975), p. 42.

110. Carneiro, "A Theory of the Origin of the State," pp. 734–737.

111. Michael E. Brown has identified four underlying causes of ethnic conflict. He argues that structural, political, economic, or cultural factors may be triggered by elite or mass movements, or by internal or external politics. Brown, "The Causes of Internal Conflict: An Overview," in Brown, Owen R. Coté, Jr., Sean M. Lynn-Jones, and Steven E. Miller, eds., *Nationalism and Ethnic Conflict: An International Security Reader* (Cambridge, Mass.: MIT Press, 1997), pp. 3–25.

112. "Clinton: U.S. Is Fighting for the World's Future," *New York Times*, April 17, 1999, p. A6.

to the ubiquity and scale of ethnic violence.<sup>113</sup> Evolutionary theory permits students of ethnic conflict to understand xenophobia and ethnocentrism as ultimate, though not direct, causes of ethnic conflict, which, like war, may result from multiple causes.

Also like war, xenophobia is found in nonhuman animals, which suggests that evolutionary theory can help explain xenophobic behavior.<sup>114</sup> The empirical evidence for this is strong. Barash has found in his studies of humans and other animals that “both . . . tend to reserve their most ferocious aggression toward strangers.”<sup>115</sup> Biologist John Fuller concludes that “xenophobia is as characteristic of humans as of ants, mice, or baboons.”<sup>116</sup>

The individual and group selection processes of evolution explain why xenophobia contributes to fitness and why humans may react negatively to people of different geographic origins, or those with different morphological features, such as facial traits or skin color. If the genetic difference is physical, then identification of difference is obvious, such as that between Africans and Europeans, but xenophobia can be triggered by even small differences between neighboring tribes or populations.<sup>117</sup> For example, Slavs typically have broad faces and Anglo-Saxons narrow ones; Tutsis tend to be tall, and Hutus short.<sup>118</sup>

According to the theory of inclusive fitness, for almost all of their evolutionary history, humans have lived in bands of genetically similar individuals. As a result, strangers were unlikely to be relatives of an area’s residents. Indeed

113. Noting the prevalence of xenophobia and ethnocentrism are Eibl-Eibesfeldt, “Warfare, Man’s Indoctrinability, and Group Selection,” pp. 178–183; A. Michael Warnecke, Roger D. Masters, and Guido Kemper, “The Roots of Nationalism: Nonverbal Behavior and Xenophobia,” *Ethology and Sociobiology*, Vol. 13, No. 4 (1992), pp. 267–282; Pierre L. van den Berghe, *The Ethnic Phenomenon* (New York: Elsevier, 1981), pp. 15–36; and Johan M.G. van der Dennen, “Ethnocentrism and In-Group/Out-Group Differentiation,” in V. Reynolds, Vincent S.E. Falger, and Ian Vine, eds., *The Sociobiology of Ethnocentrism: Evolutionary Dimensions of Xenophobia, Discrimination, Racism, and Nationalism* (London: Croom Helm, 1987), pp. 7–8, 17–20.

114. A good introduction to xenophobia in animals is Charles H. Southwick et al., “Xenophobia among Free-Ranging Rhesus Groups in India,” in Ralph L. Holloway, ed., *Primate Aggression, Territoriality, and Xenophobia: A Comparative Perspective* (New York: Academic Press, 1974), pp. 185–209. See also Holloway, “Introduction,” in *ibid.*, p. 7; and Fred H. Willhoite, Jr., “Evolution and Collective Intolerance,” *Journal of Politics*, Vol. 39, No. 3 (August 1977), pp. 667–684.

115. Barash, *Sociobiology and Behavior*, p. 219.

116. John L. Fuller, “Genes, Brains, and Behavior,” in Michael S. Gregory, Anita Silvers, and Diane Sutch, eds., *Sociobiology and Human Nature* (San Francisco, Calif.: Jossey-Bass, 1978), p. 111.

117. Alexander, *Darwinism and Human Affairs*, p. 126.

118. These differences contributed to the 1994 genocide in Rwanda because it made identification of Tutsis easier. Gérard Prunier, *The Rwandan Crisis: History of a Genocide* (New York: Columbia University Press, 1997), pp. 5–9, 249. See also van den Berghe, *Ethnic Phenomenon*, pp. 73–74. Despite the physical differences, there were some cases of mistaken identity: “During the genocide some persons who were legally Hutu were killed as Tutsi because they looked Tutsi.” Alison Des Forges, *Leave None to Tell the Story: Genocide in Rwanda* (New York: Human Rights Watch, 1999), p. 33.



they were likely to be competitors both for scarce resources and for position in the dominance hierarchy.<sup>119</sup> In addition, as described above, many anthropologists and sociobiologists surmise that humans lived in bands who fought, first, to protect themselves against rival human bands as well as large carnivores, and second, to take resources from them. Given these conditions, humans would consider other humans a threat, and thus tolerance of strangers would be low. Low tolerance of strangers contributed to fitness. Thus it spread. Although like warfare and indeed much of human behavior, xenophobia may be augmented or weakened by psychological and cultural forces.

Xenophobia may also have arisen through group selection. As human communities grew larger, multiple groups would have reproduced, some containing genotypes that resulted in an increased suspicion of strangers. These genotypes would improve fitness by increasing the survival of the group over time. Xenophobia would not only help protect resources but would also be a defense against communicable diseases, which are often caused by contact with strangers.<sup>120</sup>

Like xenophobia, ethnocentrism may be explained by inclusive fitness.<sup>121</sup> Since arising during the Pleistocene, humans have favored those who are biologically related over others. In general the closer the relationship, the greater the preferential treatment. In a world of scarce resources and numerous threats, the evolutionary process would select nepotism, thus promoting the survival of the next generation. This process is relative, however. Parents are more willing to provide for their children than they are for more distant relatives, and certainly for strangers; thus the intensity of support rapidly declines. The essence of an inclusive fitness explanation of ethnocentrism, then, is that individuals generally should be more willing to support, privilege, and sacrifice for one's family, one's more distant kin, one's ethnic group, and others in decreasing order.<sup>122</sup> As with warfare and xenophobia, however, this behavior is reinforced or weakened by environmental factors such as culture and religion.

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119. Noting the importance of limited resources is Joel R. Peck, "The Evolution of Outsider Exclusion," *Journal of Theoretical Biology*, February 22, 1990, pp. 565–571.

120. The powerful effect of disease on human society is documented in William H. McNeill, *Plagues and Peoples* (Garden City, N.Y.: Anchor, 1976).

121. Robin I.M. Dunbar, "Sociobiological Explanations and the Evolution of Ethnocentrism," in van den Berghe, *Sociobiology of Ethnocentrism*, pp. 48–59; and van den Berghe, *Ethnic Phenomenon*, pp. 18–36.

122. Ian Vine, "Inclusive Fitness and the Self-System," in van den Berghe, *Sociobiology of Ethnocentrism*, pp. 60–80.

Recognizing the evolutionary causes of xenophobia and ethnocentrism may be particularly useful for scholars who have adopted a "primordialist" approach to the study of ethnicity and ethnic conflict. They argue that ethnic identity is largely a fixed characteristic of ethnic groups and often leads to ethnic conflict.<sup>123</sup> For example, according to Robert Kaplan a significant cause of ethnic conflict in the former Yugoslavia is historical enmity, or "ancient hatreds," among Croats, Muslims, and Serbs that has existed for hundreds of years and occasionally results in ethnic conflict.<sup>124</sup> Evolutionary theory explains why xenophobia and ethnocentrism contributed to fitness and spread, and thus why these common traits account for some of the scope and intensity of ethnic conflict throughout history. So "primordialists" have a better explanation of the fundamental causes of ethnic conflict that can inform explanations of the origins of these conflicts, and why they are relatively common, without asserting that the cause is ancient hatred.

Irrespective of the ultimate causes of ethnic conflict, both the international system and individual states can work to suppress it. The bipolar international system of the Cold War helped to control ethnic conflict; and the deleterious effect of systemic change (i.e., the end of the Cold War) in promoting ethnic conflict has been well analyzed.<sup>125</sup> State policies may also help prevent or ameliorate ethnic conflict. Michael Brown summarizes the principal finding of his and Šumit Ganguly's survey of ethnic relations in sixteen Asian and Pacific states by noting that government policies "are often decisive in determining whether ethnic problems, which are inherent in multiethnic societies, are resolved peacefully and equitably."<sup>126</sup> Nonetheless, given the contribution of xenophobia and ethnocentrism to fitness during human evolution, ethnic conflict

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123. David A. Lake and Donald Rothchild use the term "primordialists" to describe the scholarship of Walker Connor, Harold Isaacs, Robert Kaplan, and Anthony Smith. See Lake and Rothchild, "Spreading Fear: The Genesis of Transnational Ethnic Conflict," in Lake and Rothchild, eds., *The International Spread of Ethnic Conflict: Fear, Diffusion, and Escalation* (Princeton, N.J.: Princeton University Press, 1998), p. 5. See also Walker Connor, *Ethnonationalism: The Quest for Understanding* (Princeton, N.J.: Princeton University Press, 1994); Harold R. Isaacs, *Idols of the Tribe: Group Identity and Political Change* (New York: Harper and Row, 1975); Robert D. Kaplan, *Balkan Ghosts: A Journey through History* (New York: St. Martin's, 1993); and Anthony D. Smith, *Theories of Nationalism*, 2d ed. (New York: Holmes and Meier, 1983).

124. Kaplan, *Balkan Ghosts*.

125. See Barry R. Posen, "The Security Dilemma and Ethnic Conflict," in Michael E. Brown, ed., *Ethnic Conflict and International Security* (Princeton, N.J.: Princeton University Press, 1993), pp. 103-124; Sandra Halperin, "The Spread of Ethnic Conflict in Europe: Some Comparative-Historical Reflections," in Lake and Rothchild, *International Spread of Ethnic Conflict*, pp. 151-184; and Milton J. Esman, *Ethnic Politics* (Ithaca, N.Y.: Cornell University Press, 1994), pp. 244-245.

126. Michael E. Brown, "The Impact of Government Policies on Ethnic Relations," in Brown and Šumit Ganguly, eds., *Government Policies and Ethnic Relations in Asia and the Pacific* (Cambridge, Mass.: MIT Press, 1997), p. 515. Brown is careful to note the impact of modernization and colonial-

is likely to be a recurring social phenomenon. Therefore ethnic conflict, like war and peace, is part of the fabric of international politics.

### *Conclusion*

The application of evolutionary theory can make a significant contribution to realism and international politics. First, it provides a firm scientific foundation for the realist argument that egoistic and dominating behavior is a result of human evolution—realists no longer need to rely on theologically or metaphysically grounded arguments to explain state behavior. In addition, for the first time, the theoretical ultimate cause of realism may be tested. Empirical predictions may be derived and tested against the anthropological evidence of early human behavior to determine the validity of a realist theory of international politics based on evolution.

Second, by demonstrating the usefulness of evolutionary theory for realism and international politics, this article is a contribution to Masters's and E.O. Wilson's broader project of applying evolutionary theory to social science. Insights for political theory, sociology, and other disciplines may be developed as well, however. A greater familiarity with the intellectual frameworks or paradigms of the natural sciences, particularly human evolution, will be useful for social science and in producing new understanding of human behavior.

The use of evolutionary theory in international politics or, more broadly, social science might seem curious to many social scientists. An implicit rule of thumb among social scientists, at least since Durkheim, is that the proper study of society requires the scientific study of an individual's environment, rather than his genes. Durkheim taught that social facts may be explained only in terms of other social facts: This often seems to be the social scientists' creed.<sup>127</sup> In general, it is reasonable to expect social scientists to be biased toward nurture or environment. Such concern is predictable because social science disciplines are anchored on the assumption that behavior is largely determined by the social environment, not by evolution. Most perceive human social behavior as malleable and to be studied under the conditions imposed by the social sciences rather than those of the evolutionary process, whose advocates tend to privilege biology over economics or political science and Darwin over Durkheim.

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ism, and regional and international influences, as well as demographic and economic factors as causes of ethnic conflict.

127. Emile Durkheim, *The Rules of Sociological Method*, trans. Sarah A. Solovay and John H. Mueller (Glencoe, Ill.: Free Press, 1965).

This article is intended to move past the false dichotomy between the social environment and evolution.<sup>128</sup> Clearly both have profound and simultaneous effects on human behavior, and each force influences the other. Evolutionary theory has defined the parameters of the human condition, or that which is essentially permanent for an individual given the human life span. Culture, as mentioned in my discussion of warfare and ethnic conflict, can often interdict the powerful effects of evolution.

The social environment and evolution will continue to have a significant effect on human behavior.<sup>129</sup> The usefulness of each depends in large part on the question or particular issue being addressed. The synthesis created by Masters, E.O. Wilson, and Somit, among others, which argues that human behavior is the product of both human evolution and environment, makes possible advances in the realist theory of international politics and, more broadly, in social science.<sup>130</sup> The application of evolutionary theory reveals insights into human behavior that purely social explanations cannot. Considering its utility more broadly, multidisciplinary scholarship informed by evolutionary theory promises to be dynamic and rewarding for the study of international politics.

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128. This debate is usually and inaccurately characterized as one between nature or nurture. The nature/nurture conflict is now commonly seen as a false dichotomy. The interaction principle is widely accepted in biology. This states that all phenotypes derive from the interaction of genotype and environment. See Robert A. Hinde, *Animal Behavior* (New York: McGraw-Hill, 1970).

129. At the same time, few would dispute the powerful effect that culture has had on human development. Its power is such that in some societies, such as Pharaonic and Ptolmaic Egypt and Incan Peru, culture overcame the incest taboo that both sociobiologist Edward Wilson and anthropologist Claude Lévi-Strauss have identified as universal for biological or cultural reasons respectively. See Wilson, *On Human Nature*, p. 38; and Claude Lévi-Strauss, *The Elementary Structures of Kinship*, rev. ed., trans. James Harle Bell and John Richard von Sturmer (London: Eyre and Spottiswoode, 1969).

130. Notable efforts to produce a theory that captures the biological and cultural mechanisms that cause human attributes are William H. Durham, "Toward a Coevolutionary Theory of Human Biology and Culture," in Napoleon A. Chagnon and William Irons, eds., *Evolutionary Biology and Human Social Behavior: An Anthropological Perspective* (North Scituate, Mass.: Duxbury Press, 1979), pp. 39–59; and Edward O. Wilson, "Biology and Anthropology: A Mutual Transformation?" in *ibid.*, pp. 519–521. See also Charles J. Lumsden and Edward O. Wilson, *Genes, Mind, and Culture: The Coevolutionary Process* (Cambridge, Mass.: Harvard University Press, 1981).