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There has been a long-standing debate in the history of moral thought over the nature of virtue—the enduring traits that are indicative of a good moral character. One tradition—represented by Aristotle, Cicero, Machiavelli, Nietzsche, and Hume—has celebrated the so-called “pagan” virtues of beauty, strength, courage, magnanimity, and leadership. Another tradition—represented particularly by theologians—has celebrated exactly the opposite set of traits: the so-called “Christian” virtues of humility, meekness, quietude, asceticism, and obedience (Berlin, 1997). But what are the virtues? Where do they come from? Why do they consist of these two apparently incompatible sets of traits? And why have they been considered moral?

Geoffrey Miller rightly argues that the virtues are not explained by existing evolutionary theories of morality, such as kin or reciprocal altruism. Instead, Miller argues, such traits are the product of sexual selection; specifically, they are products of mate choice for reliable signals of genetic and phenotypic quality. Thus, the virtues are analogous to the peacock’s tail; they are dazzling, conspicuous displays of the qualities and character traits that members of the opposite sex look for in a mate.

However, Miller’s theory leaves two kinds of virtues unaccounted for: first, virtues displayed in contexts other than courtship and, second, the traditional Christian virtues. Moreover, Miller’s theory doesn’t explain why some sexually attractive traits—such as beauty—have been considered moral. Nor does it provide a criterion for distinguishing sexually attractive traits that are morally virtuous, such as beauty, from sexually attractive traits that are morally neutral, such as immuno-compatibility.

I shall outline a more comprehensive evolutionary theory of virtue. This “conflict-resolution theory” argues that the virtues are adaptations for competing without coming to blows; they serve to avoid, forestall, or defuse more violent means of competing for scarce resources. This theory

incorporates both the “pagan” and the “Christian” virtues. The pagan virtues are “signals of superiority.” They are used to resolve conflict in two ways. First, they are used to attract mates—for here, natural selection has favored aesthetic and altruistic displays over aggression as a means of competing for mates. These are the virtues that Miller draws attention to. Second, signals of superiority are used to deter rivals. They do this as part of a “display-defer” strategy—that is, a strategy that uses, on the one hand, displays of fighting prowess and, on the other hand, ritual displays of deference to superior displays to turn otherwise bloody battles into relatively harmless contests. These displays of prowess are the second kind of pagan virtue. And this brings us to the Christian virtues. For they are the flip side of the display-defer strategy of resolving conflicts. They are “signals of submission,” conspicuous displays of deference that bring conflict to an end.

Thus, the conflict-resolution theory provides a secure theoretical foundation that accounts for a broader range of virtues and that subsumes Miller’s mate-choice theory. What is more, the conflict-resolution theory explains why these particular sets of traits have been seen as moral; it is because, like other aspects of morality, they constitute a successful solution to one of the recurrent problems of social life—in this case, the problem of settling disputes.

Below I briefly review the evolutionary theory of conflict resolution and look at some animal examples. I review the evidence for equivalent traits in humans. And I show how the conflict-resolution theory of virtue makes sense of various aspects of traditional moral thought.

### **The Virtues of the Hawk and the Virtues of the Dove**

The conflict-resolution theory of virtue begins with the logic of animal conflict. Animals often come into conflict over resources such as food, territory, and mates. On the surface, such conflicts look like straightforward zero-sum games. However, in fact, there are costs involved in conflict—time, energy, and injury—that the players have a common interest in avoiding. For this reason, in the paper that first introduced evolutionary game theory, John Maynard Smith and George Price (1973) portrayed animal conflict as a nonzero-sum game—specifically, a hawk-dove game in which the worst outcome occurs if both players adopt a “hawkish” strategy of all-out aggression. Thus, conflict presents combatants with an opportunity to cooperate, in the sense of competing in less mutually destructive ways.

Over evolutionary time, natural selection has favored a number of ways of competing that involve an exchange of signals rather than an exchange of blows. These signals provide reliable information about the relative merits of the protagonists—be it genetic or phenotypic quality, or formidability—that can settle the dispute without resort to violence. It is the traits that convey this information that have been called “virtues”.

The pagan virtues—beauty, strength, courage, magnanimity, and leadership—are “signals of superiority.”

Consider beauty. Many animals, when competing for mates, eschew violence and instead devote their energies to spectacular aesthetic displays. Peacocks, for example, compete for mates not by fighting but by growing beautiful tails. These tails act as reliable indicators of the birds’ genetic and phenotypic quality, allowing a peahen to make a judicious choice from among her eager suitors, rather than having them fight it out among themselves. In other species, bright coloration, symmetrical plumage, singing, dancing, and creativity perform a similar function (Cronin, 1992; Darwin, 1871; Miller 2000; Ridley, 1993).

Now consider strength, or “fortitude.” When engaged in direct competition with other individuals—over food, territory, and mates—many animals avoid all-out war by employing a strategy that combines “hawkish” displays of prowess with “dove-ish” displays of deference to superior displays. Maynard Smith and Price showed that such a strategy is evolutionarily stable because, when combatants differ in their ability to win a fight, it pays both parties to establish who is likely to prevail by means of an exchange of signals that reliably indicate each party’s fight-winning abilities rather than through a violent battle. And, once established, it pays the weaker party to bow out gracefully. This way, the stronger wins the resource he was going to win anyway, and both parties benefit by avoiding the costs of conflict (Clutton-Brock & Albon, 1979).

The classic example of this “display-defer” strategy comes from a study of stag red deer competing over the control of harems. The contest begins with a roaring match lasting several minutes. Roaring is a reliable signal of size and strength; usually, the stag with the less impressive roar will retreat. However, if the stags are too closely matched for their roars to be decisive, the contest moves to a “parallel walk” stage, where the combatants have the chance to size one another up. If this doesn’t settle the dispute, then the stags lock antlers and begin a pushing contest, and the loser retreats. In other competitions in other species, hawkish displays of size, weight, age, and experience may carry the day. (For a review, see Riechert, 1998.)

Next, consider altruism. Some creatures settle disputes by means of displays that, as an added bonus, provide benefits for their audience. Male ravens, for example, compete for mates not by fighting but by performing “acts of bravery”; they undertake the risky task of checking to see whether potential carrion is in fact dead and not merely sleeping or injured. “[B]y demonstrating that they have the courage, experience, and quickness of reaction to deal with life’s dangers,” says Frans de Waal (1996, 134), “the occasional boldness of corvids serves to enhance status and impress potential mates.” Similarly, male chimpanzees sometimes compete through “magnanimity”—that is, altruism directed to subordinates. They take risks in order to provide the troop with food, are generous with their own kills, and confiscate the kills of others and redistribute them. As de Waal observes, “instead of dominants standing out because of what they take, they now affirm their position by what they give” (1996, 144). Also, some primates compete for status through “public service” or “leadership”—that is, altruism in support of other forms of cooperation. Thus, dominant chimpanzees, stump-tailed monkeys, and gorillas all compete by intervening to end disputes among subordinates (Das, 2000; de Waal, 1996). These dominant individuals are unusual in that they intervene not in support of their families and allies but “on the basis of how best to restore peace” (de Waal, 1996, 129). Consequently, “the group looks for the most effective arbitrator in its midst, then throws its weight behind this individual to give him a broad base of support for guaranteeing peace and order” (de Waal, 1996, 130).

Thus, beauty, strength, courage, magnanimity, and leadership are all examples of traits that provide reliable information about the underlying qualities of the protagonists. They serve to attract mates or deter rivals. And, by doing so, they reduce or avoid the costs of violent conflict. In this way, evolutionary theory explains the existence, and conspicuous display, of exactly those hawkish traits that, in humans, have been called the “pagan virtues.”

But what about the apparently opposite set of Christian virtues—humility, meekness, quietude, asceticism, and obedience? Conflict-resolution theory has a ready explanation for these, too. They are “signals of submission,” the conspicuous displays of deference that form the flip side of the display-defer strategy of resolving conflicts. They manifest the “dove-ish” branch of the strategy—recognizing when you’re beaten and signaling to your opponent that you accept defeat and intend to withdraw, thereby bringing the conflict to an end.

Not surprisingly, dove-ish cues of submission have been designed by natural selection to be the exact opposite of hawkish cues of dominance.

Indeed, cues of submission were Darwin's prime example of "the principle of antithesis" in the expression of emotions: "directly opposite state[s] of mind" lead to "the performance of movements of a directly opposite nature" (Darwin, 1872/1998, 55). For example, when discussing submission in dogs, Darwin observed that:

The feeling of affection of a dog towards his master is combined with a strong sense of submission, which is akin to fear. Hence dogs not only lower their bodies and crouch a little as they approach their masters, but sometimes throw themselves on the ground with their bellies upwards. This is a movement as completely opposite as is possible to any show of resistance. . . . By this action [the dog seems] to say more plainly than by words, 'Behold, I am your slave.'<sup>1</sup>

In social species, where regular contests lead to the formation of hierarchies, displays of submission become swifter and more symbolic—they involve elaborate greeting rituals or "etiquette." For example, subordinate macaques give a "silent bared-teeth display" and chimpanzees "use a vocal-gestural signal of subordination consisting of repetitive pant-grunting and bowing towards the dominant."<sup>2</sup>

Thus, traits such as humility, meekness, quietude, asceticism, and obedience can be seen as different manifestations of submission—of the tendency to beat a strategic retreat in the face of overwhelming odds—which is an integral part of the display-defer strategy of resolving disputes. In this way, evolutionary theory explains the existence, and conspicuous display, of exactly those dove-ish traits that, in humans, have been called the "Christian virtues".

Thus the conflict-resolution theory explains the origin of hawkish "pagan" and dove-ish "Christian" virtues. And it also explains why these traits have been considered moral. It is simply because, like other aspects of morality, the virtues solve a recurrent problem of social life, to the benefit of all those involved. Just as conventions solve coordination problems, and reciprocity solves free-rider problems, virtues solve conflict-resolution problems.

### **Human Adaptations for Conflict Resolution**

Let's now turn to our own species. Given how widespread adaptations for conflict resolution are in nature, especially among social primates, and given that there is no reason to suppose that such traits have been erased during the course of hominid evolution, we should expect to find an equivalent set of adaptations in humans. And indeed we do.

This aspect of human nature was first described and documented by that perceptive student of the human condition, David Hume. Indeed, his account of virtue strikingly anticipates many aspects of the conflict-resolution theory that I have outlined.

David Hume compared human virtue to the hawkish displays of “excellence”—such as the peacock’s tail and the nightingale’s song—exhibited by other animals. He argued that “the same qualities cause pride in the animal as in the human kind; and it is on beauty, strength, swiftness or some other useful or agreeable quality that this passion is always founded” (1739/1985, 376–7). Hume proceeded to argue that pride is “essential to the character of a man of honour,” and that it gives rise to traits that benefit others—the “heroic” or “shining virtues” of “[c]ourage, intrepidity, ambition, love of glory, magnanimity” (1739/1985, 376–7).

Hume also discussed the social utility of dove-ish traits, such as humility. He notes that differences in ability give rise to hierarchies in which “certain deferences and mutual submissions” are required “of the different ranks of men towards each other.” He says, “Tis necessary, therefore, to know our rank and station in the world, . . . to feel the sentiment and passion of pride in conformity to it, and to regulate our actions accordingly.”<sup>3</sup> Humility, or “a just sense of our weakness,” then “is esteem’d virtuous, and procures the good-will of everyone” (Hume 1739/1985, 642).

Hume even explained why dove-ish virtues have become associated with the Christian church. He argued that humility, combined with contemplation of a “supreme being,” tends to produce exaggerated submission displays. The thought of an omnipotent god, fostered by religions such as Christianity, is apt “to sink the human mind into the lowest submission and abasement, and to represent the monkish virtues of mortification, penance, humility, and passive suffering, as the only qualities which are acceptable to him” (Hume 1757/1889, 43). In such circumstances, says Hume, “instead of the destruction of monsters, the subduing of tyrants, the defence of our native country; whipping and fasting, cowardice and humility, abject submission and slavish obedience, are become the means of obtaining celestial honors among mankind.”<sup>4</sup>

Hume managed to get this far without the aid of modern evolutionary theory. We now have the theoretical and empirical tools to develop a more up-to-date account of human virtue. And, already, several strands of research are providing support for the hypothesis that humans possess adaptations for conflict resolution, and they are beginning to shed light on exactly what they look like.

First, Allan Mazur and Alan Booth (1998) have documented how, in humans as in other animals, the hormone testosterone regulates participation in dominance encounters. Testosterone rises in anticipation of a challenge, thereby boosting “coordination, cognitive performance, and concentration” (Mazur & Booth, 1998). After the contest, levels of testosterone remain high in the winner—he experiences “increased assertiveness, and a display of dominant signs such as erect posture, sauntering or striding gait, and direct eye contact with others. [He] may seek out new dominance encounters and [is] bolstered to win them.” The loser, meanwhile, experiences a drop in testosterone “reducing his assertiveness, diminishing his propensity to display the dominant actions associated with high status, and increasing his display of such submissive signs as stooped posture, smiling, or eye aversion. . . . Faced with a new dominance encounter, [the loser] is more likely than before to retreat or submit” (Mazur & Booth, 1998, 359).

Second, there is evidence that, in addition to displays of physical prowess, men signal status with displays of intelligence, aestheticism, and creativity—the human equivalent of the peacock’s tail or the nightingale’s song. As Geoffrey Miller (2000a) has observed, in every cultural sphere, including art, music, and literature, men are responsible for around ten times as much cultural production as women; male cultural production peaks at the same time that testosterone and mating effort peaks (i.e., during early adulthood); and displays of intelligence, wit, and creativity form an important part of human courtship.

Third, there is anthropological evidence that men compete for status by performing acts of generosity and largesse, in the form of potlatch feasts, bonanzas, and festivals. For example, Kristen Hawkes et al. argue that Hazda hunters compete for status and access to mates by means of big-game hunting, which can be seen as a form of “showing off” (Hawkes, 2001). This form of hunting generates more food than a hunter or his family can eat, and the surplus meat is not distributed in the expectation of reciprocity. Rather, the distribution of meat from the kill serves to raise the hunter’s status among other men and to increase his access to mates. Hawkes reports that successful hunters are more often named as lovers and have more surviving offspring. Selection of such altruistic signals is consistent with the observation that “generosity” is universally admired in leaders (Brown 1991, 137–140).

Fourth, as predicted, women find “winning” cues of dominance and status sexually attractive (Buss, 1994; Ellis, 1992; Miller, 1998). As the anthropologist Edgar Gregersen concludes from a study of almost 300

cultures: “for women the world over, male attractiveness is bound up with social status, or skills, strength, bravery, prowess, and similar qualities” (Gregerson, 1982). Not surprisingly, high-testosterone males also report more sexual partners (Townsend, 1998). The conflict-resolution theory of virtue also predicts that, in the context of male-male competition, men should attend to, be intimidated by, and defer to hawkish traits in other males. Unfortunately, perhaps because the answer seems so obvious, this prediction has yet to be rigorously tested.

Finally, humans display typical mammalian cues of submission. As the ethologist Desmond Morris observes:

Passive submission in the human animal is much the same as in other mammals. In extreme cases it takes the form of cringing, crouching, grovelling, whimpering, and attempts to protect the most vulnerable parts of the body. . . . It presents a picture of “instant defeat” and thereby avoids the damaging physical process of actually being defeated. Its success depends on the presentation of signals which are the exact opposite of the threat signals of our species. A threatening man will square up to an opponent, his body tense, his chest expanded, his face glaring, his fists clenched, his voice deep and snarling. By contrast, the submissive individual tries to make his body seem as small and limp as possible, with shoulders hunched, his face wincing, his hands spread, and his voice high and whining. (1982, 217)

More symbolic versions of these signals—in the form of greetings, manners, etiquette, and other marks of respect—are used to lubricate formal dominance hierarchies (Morris, 1982, 217–228). And, intriguingly, the tendency to ignore cues of submission in an opponent—and hence to continue attacking a defeated foe—is one symptom of psychopathy (Blair 1997).

Much work remains to be done to develop and test this theory of human adaptations for conflict resolution. However, it is reasonable to conclude that humans do indeed possess such adaptations. We can also be confident that further attempts “to introduce the experimental method of reasoning into moral subjects” will, as Hume envisaged, shed yet more light on the nature of the virtues.<sup>5</sup>

### **Traditional Accounts of the Virtues**

The conflict-resolution account of virtue provides a rich deductive structure in which to locate, make sense of, and reconcile several previous theories of, and observations about, the virtues.

First, the conflict-resolution theory neatly reconciles the “pagan” and “Christian” accounts of virtue. In the absence of such a theory, the celebra-



tion of two diametrically opposed sets of moral virtues has been something of a scandal for moral philosophy. Surveying the debate between the pagans and the Christians, Isaiah Berlin (1997) concluded, rather gloomily, that the two sets of virtues are “incompatible” and “incommensurable”; that there is no prospect of reconciling them; and that this undermines the philosophical project of finding the single best way to live. However, as we have seen, it is a prediction of, rather than a problem for, the conflict-resolution theory of virtue that there should be two sets of traits—the virtues of the hawk and of the dove—and that these two sets should appear to be opposites. Contrary to Berlin, the theory shows that these sets of virtues are neither “incompatible” nor “incommensurable.” On the contrary, they are two sides of the same coin—two aspects of the same component of human nature. They are complementary in that they work together to keep the peace, and their contribution can be measured in the common metric of cooperation.

Second, the conflict-resolution theory explains a wide range of miscellaneous observations about virtue. For example, it explains why the word “virtue” comes from the Latin for “proper to a man” (as in “virile”);<sup>6</sup> why Aristotle argued that the most virtuous man will “offer aid readily” but “is ashamed to accept a good turn, because the former marks a man as superior, the latter as inferior” (Aristotle 1962, IV, iii, 246); and why Nietzsche argued that virtues reveal “processes of physiological prosperity or failure” and exhibit “the charm of rareness, inimitableness, exceptionalness, and unaverageness” (quoted in Miller 2000a, 337–338). The conflict-resolution theory also accounts for “superogatory acts”—acts of benevolence, mercy, heroism, and self-sacrifice that are “beyond the call of duty”—whose explanation eluded John Rawls.<sup>7</sup> The theory explains why Hume, Machiavelli, and Nietzsche criticize the Christian church for inculcating extreme “monkish” virtue—a “slave morality”—at the expense of more socially useful “heroic” virtue. And the theory explains why males and females have, traditionally, had different virtues; why the traits used to compete for paternal investment—beauty, chastity, and fidelity—are among the traditional “feminine virtues”; and why it is possible for men, but not women, to regain their “virtue” once it has been lost.

## Conclusion

In recent years, evolutionary psychologists have begun to chart the evolved mechanisms responsible for moral thought and behaviour. Kin selection explains family values and the prohibition against incest; mutualism

explains sympathy, friendship, and convention; and reciprocal altruism explains trust, gratitude, guilt, and punishment.<sup>8</sup> To this list we may now add: conflict resolution explains virtue.

The theory of conflict resolution explains why humans and other animals engage in displays of prowess and why they defer to superior displays. It explains how these hawkish and dove-ish traits help to solve a recurrent problem of cooperation—the problem of conflict resolution. And it explains why two apparently incompatible sets of traits have been celebrated as moral virtues.

Geoffrey Miller has led the way in one area of this theory. He has used evolutionary theory to derive predictions about the form and function of the signals employed in mate choice, and he has outlined a promising program of research that puts the predictions to the test. What we now need are parallel research programs in the other areas of conflict-resolution theory—answering in more detail such questions as the following: How does the psychology of dominance and submission work in humans? Which “virtues” are most effective in commanding deference and respect? To what extent are the virtues heritable? What age and sex differences do they exhibit? Which aspects of the environment are important for the development of the virtues?

Progress in this area will see a further branch of human morality demystified and its study placed on a firm scientific basis.

## Notes

I should like to express my gratitude to Helena Cronin for her invaluable support and assistance at every stage of writing this commentary.

1. Darwin (1872/1998, p. 120). The same applies to submission cues in other species. As the primatologists Preuschoft and van Schaik (2000) put it: “While threat displays accentuate size and weapons and elicit yielding on the part of the recipient, displays of submission reduce apparent size, conceal weapons, and correlate with yielding on the part of the sender” (p. 85).
2. Preuschoft and van Schaik (2000, p. 93, p. 96). Established hierarchies constitute a further de-escalation of hostilities. To quote Preuschoft and van Schaik, “dominance in groups seems to function as a conflict management device, preventing escalated competition by conventionalizing means and priority of access [to scarce resources], thus allowing for peaceful coexistence of group members” (p. 90).
3. Hume (1739/1985, p. 650). “A sense of superiority in another breeds in all men an inclination to keep themselves at a distance from him, and determines them to

redouble the marks of respect and reverence, when they are oblig'd to approach him" (p. 441).

4. Hume (1757/1889, p. 43). Desmond Morris (1982) concurs:

Religious Displays . . . are submissive acts performed towards dominant individuals called gods. The acts themselves include various forms of body-lowering, such as kneeling, bowing, kowtowing, salaaming and prostration; also chanting and rituals of debasement and sacrifice; the offering of gifts to the gods and the making of symbolic gestures of allegiance. The function of all these actions is to appease the super-dominant beings and thereby obtain favours or avoid punishments. . . . Subordinates throughout the animal world subject themselves in a similar way. But the strange feature of these human submissive actions is that they are performed towards a dominant figure, or figures, who are never present in person. (p. 229)

5. "An Attempt to Introduce the Experimental Method of Reasoning into Moral Subjects" is the subtitle to Hume's *A Treatise of Human Nature*.

6. "Appelata est enim a viro virtus: viri autem propria maxime est fortitudo" ("The term virtue is from the word that signifies man; a man's chief quality is fortitude"; Cicero, 1945, I, ix, 18).

7. "It is good to do these actions but it is not one's duty or obligation. Supererogatory acts are not required, though normally they would be were it not for the loss or risk involved for the agent himself. . . . Supererogatory acts raise questions of first importance for ethical theory. For example, it seems offhand that classical utilitarian theory cannot account for them" (Rawls, 1971, p. 117).

8. For example, see Cosmides and Tooby (2005a); Lieberman, Tooby, and Cosmides (2003); Tooby and Cosmides (1996); Trivers (1971).