

Analyse & Kritik 01/2012 (© Lucius & Lucius, Stuttgart) S. 95–115

*Kim Sterelny*

## Morality's Dark Past\*

*Abstract:* Philip Kitcher's *The Ethical Project* tries to vindicate ethics through an analysis of its evolutionary and cultural history, a history which in turn, he thinks, supports a particular conception of the role of moral thinking and normative practices in human social life. As Kitcher sees it, that role could hardly be more central: most of what makes human life human, and preferable to the fraught and impoverished societies of the great apes, depends on moral cognition. From this view of the role of the ethical project as a social technology, Kitcher derives an account of moral progress and even moral truth; a normative analogue of the idea that truth is the convergence of rational enquiry. To Kitcher's history, I present an anti-history. Most of what is good about human social life depends on the expansion of our social emotions, not on our capacities to articulate and internalise explicit norms. Indeed, since the Holocene and the origins of complex society, normative thought and normative institutions have been more prominent as tools of exploitation and oppression than as mechanisms of a social peace that balances individual desire with collective co-operation. I argue that the vindication project fails in its own terms: even given Kitcher's distinctive pragmatic concept of vindication, history debunks rather than vindicates moral cognition.

### 1. The Ethical Project

Philip Kitcher's *The Ethical Project* attempts a vindication of ethics—of the human practice of articulating, respecting and enforcing norms<sup>1</sup>—via an analytic history of the evolutionary and cultural history of the practice. The articulation, internalisation and enforcement of norms is essential, Kitcher argues, for any genuinely human social life. Articulation, internalisation are all important, so for Kitcher the ethical project is partially an aspect of the psychology of individual agents, partly an aspect of interpersonal public life. Kitcher's vindication is heterodox: moral cognition is vindicated through its foundational role in an essential social technology, not as a device that reliably tracks some aspect of the agent's environment. I endorse Kitcher's historical naturalism: his project of understanding ethics by understanding its history and role. I am sympathetic to

---

\* Thanks to Ben Fraser, Peter Godfrey-Smith, Richard Joyce and Simon Keller for their thoughtful responses to an earlier version of this paper.

<sup>1</sup> Kitcher does not sharply distinguish between moral, religious and customary norms: he argues, I think rightly, that these distinctions emerge from the evolutionary and cultural history of normative cognition and behaviour; they were not present at the take-off of this history.

his attempt to escape the cognitivism/non-cognitivism metaethical dichotomy. But there agreement ends. In contrast to Kitcher's focus on explicit norms and enforcement mechanisms, I shall follow Hume and Smith in arguing that the most valuable features of human social life depend on affiliative bonds and the prosocial emotions of sympathy. These aspects of human emotion and motivation had their origins in our great ape ancestors, but have been strengthened over the last few million years as we evolved into mutually reliant, co-operative foragers. Explicit norms (I shall argue) have played a dark role in the lives of most humans. The ethical project, as Kitcher conceives of it, has been a tragedy.

The paper is structured as follows. The *first two sections* develop Kitcher's position, sketching his history of normative practices, and explaining why he sees that history as vindicating. *Sections 4–6* then develop my anti-history, the dark history of the articulation, internalisation and enforcement of norms. I finish with a brief recap of the dialectical state of play.

## 2. Vindicating and Debunking Genealogies

Sometimes the history of a cognitive practice increases our confidence in its reliability. In the last thirty years, it has become apparent that humans are far better 'mind readers' than other great apes. We realize that we are intentional agents in a world of intentional agents, and we are good, though not perfect, at estimating the beliefs and preferences of others. There is a rich cognitive and developmental psychology of mind reading. But there is also a developing evolutionary psychology as well, rooted in the idea that humans engage in far more co-operative and collaborative activity than do other great apes, and hence they engage in collaborative planning, action, and division of a collective product in ways that our cousins do not. These social demands, in turn, require agents to be aware of one another's beliefs and motives (see, for one version, Tomasello 2008; 2009). If some version of this picture proves correct, it is a vindicating history. If confirmed, it would increase our confidence that metalising tracks, with good accuracy, an independent domain of facts. Mind-reading has enhanced our skills at social interaction only because it really does give us access to the minds of others.

In contrast, most recent work on the genealogy of moral thinking has been debunking (well reviewed in Fraser under review). This work sees human moral cognition as an adaptation, but not one designed to reliably track an independent domain of facts: facts, say, about the conditions which optimize human flourishing and social harmony. For example, on Richard Joyce's view, moral judgement is a partial antidote to weakness of the will (Joyce 2006). It evolved because souped-up great apes found themselves in environments in which their interests were almost always best served by co-operative, prosocial choices, but they also found themselves with much of their ancestors' impulsiveness and vulnerability to immediate temptations. Moral thinking—say, the thought that stealing from a friend would be shameful—added an element of hot cognition on the side of restrained prudential choice. Geoff Miller has argued that moral cognition is a

form of display: moralizing agents advertise their suitability, their trustworthiness, as partners in co-operative enterprises (Miller 1997). Debarring eccentric views about moral facts,<sup>2</sup> if these ideas are right, moral cognition could hardly be a reliable device for tracking moral facts. For these hypotheses all explain our capacity to make moral judgements without reference to moral facts. Given that, it would be a fluke if we got it right. Vary (say) the need to advertise social suitability, but not the moral facts, and moral cognition would reflect the new advertising demands.

Philip Kitcher's *The Ethical Project* defends a vindicating genealogy of moral thought and judgement, but Kitcher does so without embracing the mind-reading model of vindication. For he does not think that there is an 'external standard' that moral thought and judgement is supposed to reflect. His strategy instead is to argue that the moral institutions play an invaluable, central and irreplaceable role as a social technology. As a rough analogy, think of fire. The original domestication of fire made human life possible. It enhanced the nutritional value of food, and eased the mechanical demands of eating, but it did much more. Fire provided light, warmth, protection, and in providing these, it gives us more usable time. Once established as a central human technology, its uses expanded as human social life expanded. Some of this dynamic was doubtless a contingent response to external change. It was one damn fire after another. But some, perhaps much, was the result of reasoned, informal and formal experiment. Without doubt, some of the new uses of fire were deeply unfortunate. But fire and the control of heat retain their central role in human life, and this technology continues to mediate food, warmth and sociability. For all of the misuses of fire, we would be insane to reject or regret it. That would be to embrace a return to australopithecine squalor. Thus we can vindicate a technology through a genealogy, through showing it to be essential for the things we most value. Analogously, through his history of the ethical project, Kitcher argues that moral practice plays an essential role in making us human, in ways that it would be pathological to reject.

There is much to admire about the conception and scope of the project: the attempt to secure the virtues of a realist, cognitivist metaethics without excess metaphysical baggage, and the attempt to ground naturalism about ethics in its Darwinian and its cultural history. But I am profoundly sceptical about the execution of Philip's grand design. In this essay, I sketch two histories of the ethical project: Kitcher's history, and an anti-history, in which normative thought plays no central role in the initial establishment of human sociality, and thereafter plays its most prominent role as a tool of oppression and exploitation, rather than an amplifier of altruistic co-operation. According to this anti-history, most people in most places have been worse off as a consequence of the influence of normative thought on human motivation. The anti-history is a gross oversimplification, but there is enough truth in it (I shall argue) to seriously challenge Kitcher's project, presenting him with a dilemma. The anti-history either debunks the ethical project, or it shows that Kitcher's pragmatic vindication of

---

<sup>2</sup> For example, the idea that moral facts just are facts about the principles to endorse in intersexual advertising.

ethics does not really depend his vision of history at all. Rather, it depends on his hopes for what we might do in the future (developed in *EP*, Part III), not on what we did do in the past.

### 3. Normative Guidance and Its Consequences

Chimp life is not quite a brutal Hobbesian war of all against all. There is some co-operation in chimp social worlds: males co-operate in monkey hunts, in coalition against males from other groups, and (less stably) in local jockeying for power. This co-operation is probably fuelled by an expectation of individual reward rather than the desire to help others, but it is cooperation nonetheless (see for example de Waal 1982; 1996). Moreover, chimps have some prosocial motivations: Kitcher borrows a couple of telling anecdotes from Frans de Waal, who has long argued that sympathy and empathy have deep evolutionary routes. The anecdotes are suggestive, and they are supported by experimental data that suggests that chimps are willing to help in small ways without expectation of reward, so long as the cost of helping is minor, and the kind of help needed is sufficiently obvious (Warneken/Tomasello 2006; 2009; Warneken forthcoming).<sup>3</sup> Even so, for the most part, chimps are rugged individualists, and life for low status chimps is grim and stressful (a fact that Robert Sapolsky has documented in clinical detail for baboons). So despite these limited forms of prosociality, chimp social worlds are bully dominated. Strong, aggressive males tend to take what they want. Co-operation could not be extended beyond meagre limits, without substantial curbs on such agents. For example, chimps are compelled to be feed-as-you go foragers, rather than ‘central place’ foragers, bringing food back to a home base. Returning to a home base would make them too likely to be stripped of their food by larger stronger individuals. Without central place foraging, cooking and other forms of food processing cannot develop.

In important ways, humans escape from this relentless individualism. Perhaps with a few pathological exceptions (the Ik, the grimmest of prison communities), human life is not just co-operative, it is helpful. As Kitcher goes to great pains to show, often and importantly, aid is offered without expectation of return. Humans are altruists, he argues, not just in the minimal sense of acting in ways that promote the interests of others, but in acting in order to promote the welfare of others. Co-operation itself might not depend on such altruism: egoists can co-operate in limited ways for self-interested reasons. But foundational forms of co-operation in human social life (for example, those that unite families) are not motivated by prudential self-interest. Human social lives are imperfect. But we enjoy vastly more mutual support than chimps, and we live lives that are vastly richer in their potential than the lives of chimps.

As Kitcher reads our history, our life of mutual aid has a deep history: 50,000 years deep or more. Forager communities were the foundational form of human social life. Foragers lived co-operatively, with strong customs of mutual support.

---

<sup>3</sup> Though the experimental data is equivocal: chimps seem to act as selfish-maximisers in ultimatum games.

Around 10,000 years ago or so, these foundational communities began to transition into (or be replaced by) larger and more complex ones, as agriculture and animal husbandry became the economic foundations of human sociality. Over the last 10,000 years, an increasing fraction of the human population has come to live in much much larger groupings, in cities, under the control of formal state institutions. The fabric of co-operation was stressed in various ways by this transition, for social life became less consensual, equal, and face to face. But it survived, and in important ways was enriched. Forager social worlds were egalitarian, but the space of human possibility was constrained, in practice, and in the imaginative reach of its participants. Human social life has problems, including massive injustice. But it would be insane to renounce fire in the face of global warming; likewise, it would be insane to return to chimp sociality to escape the problems and injustice of human sociality. As Kitcher sees it, recognising this is to endorse the role of normative thinking as a social technology: it was and remains essential to our escape from the limits of chimplike social worlds.

Chimp society is pervaded by tension, often breaking out in open conflict, and much time is spent on conflict management. Altruism failure is the root of this conflict. Conflicts flare up, sometimes threatening the whole group, because one agent tramples on the desires of others. Forager social life depended on reducing altruism failure, and these failures were limited by the evolution of the capacity to understand and obey commands. Normative control was the crucial change that made human sociality possible. We evolved the capacity to respond to normative commands; initially, perhaps only external commands, but then commands taught, internalised, religiously vindicated; finally, perhaps, commands without a commander. These commands partially suppressed egoist motivations. As Kitcher sees it, the origin of co-operation depends on negative affect: normative guidance is founded in fear, fear of external punishment for disobeying external commands; a fear-driven mechanism of motivation that is driven inside the head by maternal and religious instruction. Thus:

“Mothers train their young by commanding them to share, and because of the command, the young stay out of trouble and avoid risks of injury. The repeated commands leave an echo on later occasions, and the original disposition to share is reinforced by the memory of maternal instruction. Through explicit command and fear of punishment, even the primitive punishment of the earliest stages, normative guidance can gain a purchase.” (*EP*, 90–1)

Fear of sanction made human social life possible. As social life and its accompanying moral code elaborates, normative guidance came to have a much more varied motivational base, including much more positive emotions (*EP*, 93). But it begins with the capacity to understand and respond to orders, and response to command is fuelled by fear of punishment.

These commands of normative guidance are the immediate predecessor of explicit moral norms, if not explicit moral norms themselves. If they are needed to make possible the social life of Pleistocene foragers, they will surely be needed

to make possible the social life of the more complex societies of the Holocene. For these involve much more role differentiation and interaction with comparative strangers, and as societies expanded, institutions played an increasing role in social life (Seabright 2010). Life in farming worlds doubtless involves a lot of following orders, both literal orders and internal echoes of social norms. In these more complex social worlds, the role of normative guidance changes and expands. But the core social function remains: minimising rips in the social fabric due to human altruism failure. Moreover, some of the changes in the ethical project over those last 10,000 years have been genuinely and objectively progressive. Progress is not just an increase in social peace: a change is progressive, roughly, if well-informed agents without a special axe to grind would prefer living in the new conditions rather than the supplanted conditions (*EP*, 213–218). Kitcher’s major examples of progressive change are abandoning *lex talionis* (a very literal eye-for-an-eye legal code); the abolition of chattel slavery in the USA; the expansion of female political and social rights that began in the late nineteenth century; the moral rehabilitation of gays and lesbians. From this core notion of a progressive moral change, Kitcher introduces a derivative notion of moral truth: the moral truths are the norms that are stable over an indefinite sequence of progressive moral changes. The semi-final chapter explores ideas about identifying moral truths, in this sense, thus linking pragmatic vindication to the more traditional, truth-linked notion of vindication of Joyce and others.

So the claim is that crucial, and surely beneficial, differences between human and chimp sociality are rooted in normative guidance, the capacity to respond to moral norms. Those norms maintain social peace by limiting altruism failure. That core function has refined as others have been added. Not all change is improvement. Especially as state and church hierarchies developed, the core function became encrusted with parasitic distortions. But while the dynamism of normative guidance can be mis-used, it can also be, and has been, shaped and extended by rational reflection. Moral practices can and do improve, not just change.

#### 4. Normative Guidance and Pleistocene Co-operation

My anti-history begins with the foundations of human sociality, and the role of normative thought in those foundations. I disagree with Kitcher’s diagnosis of chimp society, his picture of the transition to human sociality, and of the psychology that made this transition possible. Where he sees normative guidance—fear-based obedience to norms—I see the elaboration of impulse control, the origins of collective intentionality, the elaboration of the prosocial emotions, and the development of trust through a history of mutual interaction and emotional engagement.

*The Limits of Chimp Sociality.* Sarah Hrdy (2009) begins with an anecdote of a routinely miserable travelling experience, of her being packed with her fellow travellers into the misery of a full economy cabin and a long flight, and with a thought experiment. She images an attempt to impose the same

experience on chimps. All hell would break loose; unimaginable chaos would follow. Chimps cannot be cooped up together with nowhere to go. But their problem is not altruism failure but social stress and impulse control. Of course, impulsive eruptions do lead to altruism failure, as agents in the grip of passions run amok, but they also lead to egoism failures. Chimps on a plane would not be well-captured by a *Pan economicus* model. Acting on impulse sabotages an agent's own hopes, frustrates an agent's own interests.<sup>4</sup> Chimps need Ritalin not normative guidance.

As Ben Jeffares has noted, improved hominin impulse control might well evolve through foraging innovations rather than direct selection for improved abilities to co-operate. In making and using advanced stone tools (beginning around 1.7 mya), agents engage in activities which require focus, requiring them to resist distraction. Moreover, these activities do not have immediate payoffs. Acheulian handaxes cannot be made in a few minutes from near-ubiquitous raw materials. Their users need to make them well in advance of need; anticipate those needs, and remember to collect and carry them after use. That is even more true of the Middle Stone Age technology that begin to appear about 250 kya (Jeffares 2010). As collaboration became more important, that too selected for impulse control but it did so in conjunction with changes in hominin foraging regimes. Improved impulse control opens the door to many forms of prudential co-operation; it makes it possible to share joint product without the squabbling, snatching and fighting that would wreck further co-operation. Peaceable co-operation, even if it does not initially depend on prosocial emotions, will select for those emotions. All else equal, more tolerant, more generous agents will find themselves in more mutually profitable joint activities.

**Collective Intentionality.** Michael Tomasello has recently argued that the most important single cognitive difference between humans and chimps is that humans form joint intentions, which result in joint action (Tomasello/Carpenter et al. 2005; Tomasello/Carpenter 2007). A joint intention is partly cognition, partly motivation. It is cognitive, in so far as joint intention presupposes mutual awareness of others' intentions, and of the theatre of action. But it is also partly motivational: each part acts jointly at least in part because the other is too. When I go for a walk with my partner Melanie up Black Mountain, one reason to walk, for both of us, is that we are doing it together. Humans find collective activities intrinsically rewarding, as the phenomenon of team sports shows. Felix Warneken shows that young chimps do not. In the right circumstances, they will collaborate for instrumental ends, but in contrast to young children, they abandon collaborative activity as soon as those instrumental purposes are served (Warneken forthcoming).

Collective intentions are not captured through contrasting egoist and altruistic motivation. Kitcher writes:

“[...] altruists have a particular kind of relational structure in their psychological lives—when others are around, the altruist's desires,

---

<sup>4</sup> See for example Sally Boysen's famous experiments on chimps' difficulties with impulse control: they find it very difficult to point to a small item of food in order to get a larger one (Boysen 1996).

hopes, intentions and emotions are different from what they would otherwise have been, closer in some ways to those of the others, and the difference is produced by some form of response to those others, not by something enclosed within the self (calculation of future benefit, for example).” (*EP*, 30)

But altruism is only one way of having a socially responsive motivational structure. Walking up the hill with Melanie is not altruistic: I want to walk up the hill; I am not doing it as a favour. But my desire to walk up the hill is there in part because she is with me and she wants to do it too. So you do not always need to enhance altruistic capacities to enhance prosocial, other-responsive capacities. Joint intentionality points to an alternative picture of socialisation, and an alternative route to co-operation; one mediated by positive affect: games rather than canes.

In a childhood of joint games and collective interaction, children learn to enjoy collaborative interactions. Associative links develop between their sympathetic response to the plans and intent of their playmates, and their playmates’ positive affect. That positive affect in turn spreads, via a contagion-like phenomenon, back to the child who initially acted in sync with their partner’s desire. The author of the sympathetic response comes to feel good about himself and his actions. Collective childhood games can teach the skills need for collaborative action, while entrenching pleasurable responses to others’ pleasure. Moreover, through those games, children can learn to associate a favour done with a favour returned. A sympathetic response to others tends to result in their similar response to you; likewise harm leads to harm. This need not be conscious and explicit: children can learn moral habits by association, in suitably collaborative, interactive childhoods.

In our lineage, with its long history of selection for collaborative action, enjoying acting collectively is probably genetically entrenched. It certainly emerges early. But it need not have begun as a happy genetic accident. For there can be a learned association between collective action and reward, which then becomes genetically assimilated.<sup>5</sup> Here is one scenario. In the early stages of the transition to co-operation, adult bonds were probably made habitual through association, as adults began associating for instrumental reasons. Acting together, they were safer or more successful than when foraging alone. Suppose (as is plausible) that as climate changed and hominins found themselves in open woodland and grassland, it was safer to forage with one or two others, each eating what they found, but each contributing to vigilance. If specific associations become habitual, and turn into a successful and persistent partnership, each will begin to associate the others’ presence, and acting with the other, with success, with reward. They learn to like being with one another, because being with one another leads to good things. Suppose the environmental change that makes foraging in company safer persists. There will then be selection that favours those that are more tolerant and accepting of others’ presence, those that find

---

<sup>5</sup> For a rich and detailed defence of the importance of this general mechanism, see West-Eberhard 2003.



it easier to establish such partnerships. Social bonds that were initially mediated by quite general learning mechanisms come to have a more specific genetic component.

**Norms and Prosocial Emotions.** I have just suggested that amplifying the positive emotions of affiliation played a fundamental role in the evolution of forager sociality, but Kitcher is rather sceptical about prosocial emotions and their potential for stabilising rich forms of social life. His picture seems to me to undersell the importance of prosocial emotions in driving co-operative behaviour: his picture is too intellectualist. Kitcher recognises those emotions, and accepts that they can motivate altruistic co-operation. Sympathetic and empathetic responses explain the limited forms of altruistic help we see in chimp social life. But Kitcher seems to think that prosocial emotions can motivate co-operation only in direct, face to face interactions: interactions in which (say) I see and hear your distress; your distress causes me distress, and that in turn drives my co-operative response. But out of sight, out of the scope of subcognitive co-operative response. If prosocial emotions can secure co-operation only in face to face interactions, then clearly we need extra ingredients to explain forager social life. For that form of social life certainly involves bringing resources back to a home base to share. But why do we need more than the social emotions?

Kitcher writes:

“imagine a female finding a carcass in the absence of her young. Instead of devouring it on the spot, she quickly summons her young. *It is difficult to think of behaviour of this sort as action driven by instincts or emotions.* Apparently, the mother has to recognise this as food she can share, and prefer sharing to devouring it entire. Perceiving the possibilities for her young, she forms a different desire from the one she would have formed had they been out of range.”  
(EP, 37)

I find the example unpersuasive. First, it overlooks the power of associative learning. The chimp mother can learn that she likes feeding her young by association and arousal. Suppose (a) in situations with her offspring present, she tolerates their taking food she has found, perhaps after she herself is satiated. (b) Her offspring enjoy the food, and so they experience positive affect. They are happy and buoyant, rather than clinging and whiny (c) through subcognitive mechanisms of contagion and arousal, their positive affect causes positive affect in her, helped perhaps by her own background state of pleased satiation. (d) As a consequence of this connection, perhaps repeated a few times, the mother learns to associate feeding her young with positive affect for herself. So (e) when she comes across a large and enjoyable food source, she spontaneously recruits her offspring to that source.

There is a second possibility. Perhaps the mother's actions are indeed driven by topdown mechanisms: by her capacity to understand the situation and through her altruistic preferences. The preferences might well be caused by prosocial emotions. Imaging pleasure in others can cause us to feel real pleasure: for example, imaging the response to a well-crafted surprise treat. The mother

remembers the pleasure she has felt in the delighted and excited response of her young to highly desirable food (no vegan scruples here to overcome). She imagines how delighted they will be, and her vivid imagination causes a reweighting of her preferences. The thought of their delighted cries makes her feel good in anticipation. Tempting though the meat is, she (unlike real chimp mothers) wants to share the pleasure, rather than annex it all to herself. This would be a cognitively rich explanation of the mother's actions, relying on imagination and its affect on preference, rather than a learned association. But there is still no need for norms or commands.<sup>6</sup>

**Norms and Punishment.** In assessing Kitcher's picture of the role of punishment in early human co-operation, his model of the fitness landscape becomes important. Kitcher rejects, for good reason, simple reciprocation-based models of the evolutionary benefit of co-operation based on iterated tit-for-tat and its relatives. Those models leave a crucial element of the social ecology: agents often have a good deal of choice in their associations: they have opt-out options which must be factored in to the fitness landscape. In response, Kitcher introduces a coalition game, in which agents who can develop co-operative partnerships exclude solitary individuals from resources. Thereafter groups grow by accretion, through coalitions being forced to merge. Group formation is driven by an inter-coalition arms race. This model is not realistic. For selection to favour the collective defence of resources, resource patches have to be rich, predictable in their location, and rare. If they are scattered unpredictably in small and fairly numerous parcels, selection favours solitary foraging (Foley/Lee 1989; Foley 1995; Kaplan/Hooper et al. 2009). Great ape and early hominin resources almost certainly were scattered, numerous, individually small. They ate fruit, insects, small animals and the like. Co-operation changed the hominin resource envelope, but it did so by making new resources available that were not previously accessible to individual foragers: for example, by groups of hominins driving predators from their kills, and thus seizing their meat. An individual habilene or erectine could not have safely driven a leopard or hyena family from a kill. These were not resources for individual hominins; a predator kill was not an affordance for an individual. Co-operation did not (typically) allow coalitions to expropriate resources that would have been available to individuals, had they not been stripped of them by pairs or triplets. Neither evolutionary modelling nor phylogeny suggests that hominin social worlds were formed by accretion from solitary life, as coalitions formed then merged. In the hominin lineage, social life came first, and co-operation then expanded. Living socially is the primitive

---

<sup>6</sup> Kitcher also suggests that altruism based on sympathy is fragile in the face of strong temptations. So he notes that in chimpanzee social life, prosocial emotions of affiliation do not prevent altruism failures while the stakes are high, citing de Waal's example of friendship fractures in the three way maneuvering for power between Yeroen, Luit, and Nikkie in the Amsterdam colony (*EP*, 69–71). But nothing reliably induces altruism when the stakes are very high. Moreover, to the extent that our history made us less liable to defect in such situations, that may be because our social emotions are more powerful and more readily engaged. Evolutionary change usually works by modifying existing traits rather than building new ones from scratch, for populations usually contain selectable quantitative variation in existing traits.

condition in great apes and monkeys. The received wisdom is that primate social life originally evolved to minimise predation threat (Dunbar 2001).

It follows that the road to forager co-operation begins in established social groups with significant power inequalities. This is relevant to Kitcher's picture of the role of punishment in the transition to forager sociality. The paradox that Kitcher faces is that his picture presupposes language, as explicit prohibitions are formulated, enforced, taught to children, internalised. This vision presupposes a group life in which sophisticated language is already present. But that in turn presupposes a social life that has long-been co-operative. Language is a particularly subtle and complex form of informational co-operation, and one that depends on elaborate morphological (and, very likely) cognitive adaptations (see for example Fitch 2009). Language is an expression of co-operation; a tool of co-operation. Language amplifies co-operation by enhancing the importance of reputation, and through solving co-ordination problems. But it cannot be the precondition of any co-operative form of life significantly richer than the marginal co-operation of chimp social worlds. So if punishment is the root of co-operation, punishment must precede that evolution of language and of norms.

Kitcher does not think this is a problem; I do. Kitcher thinks that there is punishment in chimp societies, and that makes it plausible to think that the initial stages of the evolution of a more co-operative social world could be based on punishment, albeit a crude, pre-linguistic form. But chimp punishment is part of the problem, not the solution. Chimp punishment is imposed by large males, normally alpha males: punishment is only cheap if it is imposed by the most powerful individuals in the group. And while it might increase social peace (it is quite often targeted at those initiating conflict) it is not altruistic, in the sense of punishing altruism failure. It is the peace of the victors, stabilising the inegalitarian distribution of privilege in chimp society (Flack/de Waal et al. 2005; 2006). Conflict, after all, can stem from a chimp's protests about being badly treated, so imposing social peace is as likely to support altruism failure as punish it. Moreover, and more importantly, forager sociality is egalitarian, and since great ape societies are not primitively egalitarian, that is an evolutionary innovation in the human lineage. Almost certainly, this innovation has depended on anti-dominance coalitions: of lower ranked individuals acting collectively to impose restraint on those who would otherwise have the physical skills and the will to impose themselves (Boehm 1999; 2000).

In explaining this crucial transition in hominin sociality, chimp-like, topdown, alpha-driven punishment is part of the problem, not part of the solution. Frans de Waal's gripping descriptions of chimp politics show that alpha males have the social intelligence to recognise the threat posed by internal coalitions, and vigilance and determination to disrupt those coalitions by punishment (de Waal 1982). Thus the early history of hominin co-operation included some solution to the paradox of deterrence. Enforcement coalitions (as Chris Boehm shows) can suppress potential dominants in forager social worlds, but even in those worlds, with their advantages of language and of long-established norms of co-operation and of egalitarianism, punishment can be costly to the punisher. When everything goes well, when the coalition acts together resolutely and efficiently,

no individual can stand against it. But when coalition formation is slow and hesitant; if co-ordination miscarries, so the target of the coalition can identify and act against key figures before they have rallied full support, then being part of an anti-dominance coalitions can be very dangerous indeed; their targets *are* targets precisely because they are so dangerous. Given that, what makes the threat of an anti-dominance coalition credible against its likely targets?

The members of a putative anti-dominance coalition must trust one another, and I doubt that proto-punishment and proto-obedience to command play much role in securing trust.<sup>7</sup> Rather, trust is secured by an interaction between the moral emotions and a history of successful co-operative interactions in foraging and collective defence. Robert Frank has argued that the moral emotions secure trust precisely because they are emotions and hence not under topdown control: they function both as difficult-to-fake signals of stable behavioural dispositions, and as relatively resilient stabilisers of those dispositions (Frank 1988). Dan Fessler and I have argued that these internal motivational levers stabilise, and are stabilised by, external economic ones. Partial solutions to trust problems secure a pattern of association that is valuable in itself, which acts as a further signal of agent quality to third parties, and which strengthens the subjective bonds of mutual affiliation (Sterelny 2012; Fessler/Quintelier forthcoming). Agents with a history of successful collective action bond. Those bonds can be very deep and powerful indeed, if the collective action is both prolonged and stressful. This is very vividly expressed in soldiers' war memoirs (see for example Fraser 2001).

Thus the road to co-operation does not begin with chimp like punishment. It begins with an initial expansion of ecological collaboration: perhaps first as collective defence against predators,<sup>8</sup> and then perhaps as bully scavenging, driving predators from kills. Even in the face of an unequal distribution of the food at the kill site, all or most would benefit. As collective activity expands (even though the profit at first is not divided equally), early hominins are evolving cognitive skills of co-ordination, partner choice, signalling and investing in reputation. These build the cognitive and social preconditions for anti-dominance coalitions. Pleistocene co-operation depends on trust, and trust depends on the coupling of a history of successful collaboration with prosocial emotions. Following orders has nothing to do with it.

## 5. Where Do Norms Really Come from?

On the view presented here, the notorious 'folk theorem' broadly captures the selective landscape of the transition to forager sociality. Ancestral hominins interacted frequently, in small groups. They had every reason to expect these

---

<sup>7</sup> Chimps sometimes mob alphas in moments of high arousal, as anger or frustration spreads through some contagion-like mechanism (de Waal 1982). But the effect on alphas is ephemeral: extended control will depend on more systematic and sustained pressure.

<sup>8</sup> I think this was probably first, both because changes in early human habit (from forest to open woodlands and grasslands) made them more vulnerable to predation, increasing the selective benefit of co-operation, and because collective defence does not pose a division of the profit problem. If defence is successful, everyone in the group automatically benefits.

interactions to continue indefinitely into the future. These agents were intelligent enough to recognise their fellows, place them in a network of association, remember their past acts, adjust their own acts to that history. Very likely, even before the origins of gossip, how others acted towards third parties would be noticed, remembered, and would influence future choice. There were rewards for co-operation, rewards which increased over this transition. Reputation was important, and so it could pay to invest in reputation by showing a willingness to punish (these claims are defended in detail in (Sterelny 2007; 2012)).

As shown in the previous section, I am sceptical about the idea that explicit normative thought was a critical proximate mechanism mediating this transition, or stabilising it once made. It is true that foragers do indeed have explicit levelling norms. But it is not at all obvious that those norms explain egalitarianism. First, there are material factors in play. Forager work is highly skilled: foragers are mobile masters of fieldcraft, responsive to local contingencies, often with arms and expert in their use. Female and male labour is not just skilled, it is complementary, with male returns showing higher peaks but more variance. It is difficult and expensive to control such labour by coercion. In contrast, many farming societies have depended on slave labour. There are wealth differences in extant forager societies, but life prospects depend more on social and embodied capital.<sup>9</sup>, and less on material wealth, in part because mobility constrains the acquisition of material goods. These forms of capital are less routinely heritable, so there is much less of a default accumulation of wealth differences across generations. Finally, while farmers are tied to their plots, foragers are not; they can and do just move away in response to would-be leaders (see Bowles/Smith et al. 2010; Smith/Borgerhoff Mulder et al. 2010; Smith/Hill et al. 2010)

So there is an alternative account of the egalitarian nature of forager society, and that materialist account seems to be confirmed by the fact that forager levelling norms did not prevent the rise of hierarchy, once the economic foundations of society changed. Rather than norms, the psychology that mediates this transition is an expansion and intensification of social emotions. The crucial problem is to establish bonds of trust and signals of trustworthiness. Moralising and fear-driven obedience to command will not do the job. The psychological foundations of forager egalitarianism are not to be found in cowardice, but in courage: in the positive affiliations, developed through successful collective activity and by the increased sensitivity to your social partners—strengthened sympathy—that these patterns of supportive association build. These internal levers are reinforced by knowledge of the crucial importance of those bounds to your life's prospects.

However, if explicit norms were not critical in the establishment of forager sociality, what is their origin? Here is a speculation. Forager co-operation has very deep roots, but there are signs that about 100 kya (and especially from 50ya), forager worlds began to change. Much of this is discussed under the label of the origins of 'behavioural modernity' or 'modern human behaviour' (McBrearty/Brooks 2000; Nowell 2010). The idea is truly ancient forager soci-

---

<sup>9</sup> Social capital is one's network of potential allies and supporters; embodied capital is skill, strength, health and the like.

eties are simplified by comparison with those known from ethnography, but that from approximately 50 kya, we see signs in the archaeological record of cultures that fall within the historically known range. There is certainly an expansion of technology and of the pace of innovation: the toolkit is more regionally varied; there are more specialised tools; they are made from more materials (ivory, horn, bone much more widely used). There are indirect signs of enhanced technology: humans invade the most difficult habitats: arid Australia, the far northern latitudes. Humans now clearly have the technology to kill at a distance: they have spear-throwers; bow and arrow technology. The resource base expands. In the eyes of many, even more important is the clear appearance of material symbols in the record: first jewellery and style imposed on utilitarian technology; then grave goods, cave paintings, a few figurines, musical instruments. There is also some sign of greater wealth differentials. Late in the Pleistocene (perhaps between 20 and 30 kya), we begin to find quite spectacular grave goods: one grave contained teeth from at least 63 foxes; another contained over 5,000 beads (Wynn/Coolidge 2004, 480).

These changes are likely to be an effect of larger and more complex social worlds (Powell/Shennan et al. 2009; Sterelny 2011). The improvement in technical skill is plausibly explained as an interaction of demography with cultural learning: local populations reached a threshold at which informational resources were more reliably retained and improved. Local groups were larger, and perhaps more regularly in contact with others. The same demographic factors may well explain the expansion of specialised toolkits: a larger market size made specialisation viable (and perhaps necessary, if at the same time human populations were squeezing the supply of their favoured target animals, large to medium game).

Social decision making and the division of the social product is relatively straightforward in an unspecialised economy. If, say, the supply of meat depends on all the adult males working together, with each playing a similar role:<sup>10</sup> for example, throwing rocks, waving spears, making a din, to scare a pack of hyenas from a kill, fair division is not challenging. Agents do not differ markedly in status and power; all those involved have made a similar contribution. We might expect something like a routine default of equal shares, either amongst the males or with the group as a whole (Skyrms 1996). But the record suggests that by (say) 30kya, forager social worlds have developed significant occupational differentiation: some specialise in fishing, others perhaps wildfowl; some specialise in artisan skills; trade and interaction with other groups has become more frequent. With the invention of bow and arrow technology, hunting parties are now small, with different targets and different degrees of success. In such an environment, even with good will, and even if free-riding is not a major threat, deciding on fair terms of trade might be quite difficult (Ostrom 1998).

If divisions have to be made on a case by case basis every time, division could easily become a source of tension, a potential flashpoint for stress and

---

<sup>10</sup> In many forager cultures, gathered resources are not routinely shared beyond the family circle: the rough rule of thumb seems to be that small, individually collected food packages go to the family; large, often co-operatively collected packages are shared.

conflict. Customary defaults would reduce social stress and transaction costs. So I suggest that norms emerge as pricing mechanisms. They co-ordinate or regulate sharing social product, as that product comes to be more diverse in itself, and comes to be generated by agents whose contribution to that product is increasingly heterogeneous over space and time. Perhaps they also play an important role in regulating interactions with those outside the group, as such interactions come to be a more regular experience. There is evidence from contemporary ethnography of quite elaborate norms of division of a social product: Alvard/Nolin (2002) is a classic study of whale hunting, and it details quite complex division norms. Alvard (2002) and Gurven (2004) are more general surveys of sharing, and they too give many examples of division norms that recognise different roles in producing the social product. On this view, the foundational role of norms is not that of minimising altruism failure, though once norms are available as a social technology, no doubt they could be and were co-opted for that role. Rather, their role was to manage economic complexity.

## **6. Bad Moon Rising: Norms and Elites**

Kitcher argues that the history of the ethical project is the history of a social technology; a technology that generates benefits that are indispensable for any truly human life. But in their different ways, detective fiction, Karl Marx, and recent evolutionary biology have taught us to ask, whenever benefits are mentioned, 'benefits for whom?'. For whom does the social technology of normative guidance produce benefits? While Kitcher is deeply sensitive to the injustices of civilisation and to the inequalities of wealth and power in complex society, he does not place the interaction between norms and inequalities at the centre of his history of the last ten thousand years. My anti-history will do just that.

I argued above that Pleistocene forager co-operation evolves through mutual profit: individual Pleistocene foragers enhance their fitness in cooperation, because co-operation is profitable, and they get their fair share of that profit. That explanation makes the survival of co-operation through the Holocene deeply puzzling. That transition began with the establishment and spread of farming (itself a puzzle: Cohen 2009). Farming, probably because it increased the importance of readily heritable wealth, and decreased the importance of embodied capital, especially skill, left groups vulnerable to inequalitarian transitions (Shenk/Borgerhoff Mulder et al. 2010). Indeed, the transition to agriculture and then to agricultural state society led to perhaps the least egalitarian societies in human history. If I may speak personally for a moment, viewing the Egyptian pyramids was one of the most depressing sights of my life: they must have absorbed an astonishing proportion of the social surplus, in the service of rapacious egomaniacs.

We do not have a convincing model of the transition to agriculture and then to state societies (Sterelny forthcoming). One puzzle is that the archaeological record seems to show that in many places inequality developed before, sometimes hundreds of years before, the establishment of states with their efficient coercive

powers (Bogucki 1999). The development of complex, stratified societies saw a long period of the coexistence between (a) collective action involving many or most members of local groups (b) significant inequality, and hence significantly unequal returns from collective action; (c) minimal and inefficient mechanisms of coercive control. Indeed, the record suggests that the scope of collective action expanded, for some stratified pre-state societies organised labour-intensive programs of public works; one example is Stonehenge. Thus collective action persisted through the transitions from foraging, to small scale farming, and thence to larger, more vertically complex, inegalitarian, command-and-control societies. The emergence of elites in these stratified societies is a triumph of free-riding, and free-riding had long been under control. So its escape from control in Holocene needs explanation.

As I see it, there are four mechanisms which might contribute to the explanation of the survival of co-operation and collective action in stratified societies; environments in which many of those investing in a social product get little of that product. (i) In some circumstances, low-ranked agents may have made the best of poor circumstances: other options are even worse. Once mechanisms of state coercion were available, and acted in support of elites, presumably this mechanism became very important. (ii) Perhaps low ranked agents suffered from adaptive lag, failing to assess their circumstances appropriately. They suffered, as old leftists used to say, from ‘false consciousness’. Co-operation was not in their interests, but they lacked the cognitive resources to respond appropriately in a new world of winners and losers. To the extent that this mechanism was important, agents’ sensitivity to norms and to normative guidance probably protected violations of altruism; it does not control such violations. (iii) Perhaps the poor co-operated because it was adaptive for the group, even though there was nothing much in it for them as individuals. From the late Pleistocene or early Holocene, there is archaeological evidence suggesting high levels of violence and the threat of violence between groups. The shift to farming may have bought with it quite intense group selection (Bowles 2009; Seabright 2010). (iv) Finally, there may well have been a devil’s bargain between the top and the middle against the poor. Subsistence farmers need to be risk averse, and in middling groups, risk aversion might have manifested itself through defending social norms that endorsed their rights to the lands they worked.

I suspect all of these mechanisms were important, but in particular, how important was false consciousness? The short answer is that we do not know. But I shall conclude the main argument of this essay by sketching three reasons for thinking that it played a pivotal role in elite aggrandisement.

(i) *Foragers were ripe for manipulation.* To advance their interests, agents must be able to identify the options available to them, and estimate the likely outcomes of their choices. As social worlds became larger and more complex, agents probably became more dependent on others for the informational resources needed to identify and evaluate their choices, and that in itself made them more vulnerable to manipulation. But humans can be manipulated through their motivations, not just their beliefs. Perhaps as a consequence of a long evolutionary history in very varied environments, to some extent human proximate



mechanisms are plastic: we sometimes learn what we want, not just how to get what we want (Sterelny forthcoming). Think, for example, of how disgust responses are culturally modulated and recruited into normative judgment (Prinz 2007). Thus many in the west now find obesity disgusting, not just unwise. So humans are potentially vulnerable to manipulation both through misinformation (for example, through culturally amplified lore about the Unseen Eye that monitors and punishes behaviour) and motivation shaping (teaching, not always unsuccessfully, of the delights of conforming your will to that of the Unseen Eye). Chimps have their limits, but they are not suckers.

(ii) *Investment in ideology.* The economics of normative institutions suggests that they play an important role in stabilising the power of elites. For elites paid for institutions that broadcast vindicating ideologies. The historical record of early civilisations shows heavy investment in, and coercive protection of, state religions. These religions produced vindicating ideologies of the special status and power of elites, typically claiming special links between elites and the Unseen Eye. Perhaps this money was wasted, and would have been better spent on larger armies or more brutal police. But the practice of supporting expensive state religions was very widespread in ancient farming states and their successors; it seems unlikely that all those elites wasted the money they spent claiming that that they had the mandate of heaven and the ear of its guardian.

(iii) *Norms, reasons, causes.* Kitcher is at pains to argue that norms are subject to rational evaluation, and that normative practices change for the better as a consequence of that evaluation. The examples he gives are certainly plausible examples of progressive moral change by the criterion he develops. Moreover, in the public debates about these changes, the advocates of change are on the side of reason, at least by our lights.<sup>11</sup> But even if that is true, it by no means follows that the rationality of the reforms *caused* the reforms. The end of slavery, the extension of legal and political rights to women, the detoxification of homosexuality, all coincide with times of momentous exogenous social and economic change. Fine-grained histories of (say) women's suffrage often emphasise the complexity and contingency of the legal and political process. See for example Daley/Nolan (1994), who explore the puzzling phenomenon of early suffrage in Australasia, not normally taken to be societies of special moral insight. Other examples strongly suggest that the normative world of a culture is powerfully shaped by political and social forces, in ways that lead those norms to vindicate current social arrangements. For example, it has been convincingly argued that racist ideologies were articulated more frequently, in more detail, and with more

---

<sup>11</sup> The reservation 'by our lights' is significant. The 'pessimistic meta-induction' over the history of science concludes that the history of radical theory change in the past should lead us to suspect that from the viewpoint of the future, our current best scientific theories will be seen as hopelessly inadequate. One good response to the pessimistic meta-induction is to point out that we have not just changed our first order theories about the world; we have changed and much improved our ways of doing science. The epistemic foundations of recent science are more secure than those of older science. So we are entitled to greater confidence in our current views. Kitcher rejects the possibility of moral expertise, and rejects any robust conception of moral facts. So he is more vulnerable to a pessimistic meta-induction over changes in moral view.

cultural salience in Europe as European imperialism became a central feature of world politics (see for example Belich 1986).

The normative institutions of a culture are not just a simple reflection of elite needs, a mere tool of elite exploitation. But that coarse caricature of normative institutions is closer to the truth than a picture according to which these institutions:

- (i) mediate social peace and restrain altruism failure in ways that are neutral with respect to agents' places in the social hierarchy
- (ii) change in progressive ways as a result of reason and reflection.

In a series of justly famous papers, Imre Lakatos defends the rationality of science by constructing an idealised, rationally reconstructed history of paradigm examples of theory change in science (Worrall/Currie 1978). The ideal history is not a mirror of the real history, but it vindicates the rationality of science, showing science to be an engine for finding out what the world is really like. But it does so only because and to the extent that (a) the real history resembles the idealised, rational history; the ideal history is a good model of the real history, and (b) Lakatos's examples are both important in themselves and representative of the rest. To vindicate science, Lakatos's examples must be genuinely exemplary. Kitcher's examples might indeed play a vindicating role if, first, we thought that they were typical of normative change, or an important class of normative changes, and if, second, we thought the reasons for change were causes of change. For then, the fact that people—most people, not just elites—would be better off after the change would help explain the change. In turn, we could then be confident that the normative practices of the culture were, at least in these cases, sensitive to the needs of the community as a whole. But Kitcher's discussion gives us no reason to believe the typicality thesis or the causal thesis.

## 7. Overview

Kitcher makes bold claims about the role of norms in human social life: norms were essential to our escape from an endless, chimplike, cycle of squabbling and reconciliation (though bonobo-style reconciliation might have its compensations), and they remain essential to any genuinely desirable human life. Pragmatic vindication might not need quite so strong a historical thesis. But I do not think that any pragmatic vindication via history could be compatible with the dark history I have painted of the impact of normative judgements (as these are organised, amplified and entrenched by social institutions) on ordinary human lives. I have painted that picture especially of its role over the last 10,000 years. I have followed Hume and Smith in arguing that most of what is good about human social interaction is explained not by our explicit normative beliefs, but through our prosocial emotions of sympathy and affiliation. These were strengthened from their primate roots as we evolved over the last two million years as co-operative, encultured foragers. Explicit norms did play an important

and valuable social role at one point of this transition, but one that was hijacked by elites after the establishment of agriculture. No doubt this picture is too dark, and normative thought has played some positive role, both anciently and more recently. Even so, morality's history is dark enough so that its history, its historical function, is no vindication. Norms have played too dark a role in the stabilisation of appalling inequality, and too little a role in facilitating decent interpersonal interactions. Kitcher's picture of the role of norms in our past needed more Marx and less Kant. He has backed the wrong German.

## Bibliography

- Alvard, M. (2002), Carcass Ownership and Meat Distribution by Big-game Cooperative Hunters, in: *Social Dimensions in the Economic Process* 21, 99–131
- /D. Nolin (2002), Rousseau's Whale Hunt? Coordination among Big Game Hunters, in: *Current Anthropology* 43(4), 533–559
- Belich, J. (1986), *The New Zealand Wars and the Victorian Interpretation of Racial Conflict*, Auckland
- Boehm, C. (1999), *Hierarchy in the Forest*, Cambridge/MA
- (2000), Conflict and the Evolution of Social Control, in: *Journal of Consciousness Studies* 7(1–2), 79–101
- Bogucki, P. (1999), *The Origins of Human Society*, Oxford
- Bowles, S. (2009), Did Warfare among Ancestral Hunter-Gatherers Affect the Evolution of Human Social Behaviors?, in: *Science* 324(5932), 1293–1298
- /E. A. Smith et al. (2010), Introduction to the Special Section: The Emergence and Persistence of Inequality in Premodern Societies, in: *Current Anthropology* 51(1), 7–17
- Boysen, S. (1996), More is Less: The Elicitation of Rule-Governed Resource Distribution in Chimpanzees, in: Russon, A./K. Bard/S. Taylor Parker (eds.), *Reaching into Thought: The Minds of the Great Apes*, Cambridge, 177–189
- Cohen, M. N. (2009), Introduction: Rethinking the Origins of Agriculture, in: *Current Anthropology* 50(5), 591–595
- Daley, C./M. Nolan (1994) (eds.), *Sufferage and beyond*, Auckland
- de Waal, F. (1982), *Chimpanzee Politics: Power and Sex amongst the Apes*, New York
- (1996), *Good Natured*, Cambridge/MA
- Dunbar, R. (2001), Brains on Two Legs: Group Size and The Evolution of Intelligence, in: de Waal, F. (ed.), *Tree of Origin*, Cambridge/MA, 173–192
- Fessler, D./K. Quintelier (forthcoming), Some Noncommittal Musings on Subjective Commitment, Objective Commitment, and Biological and Cultural Evolution, in: Calcott, B./B. Fraser/R. Joyce/K. Sterelny (eds.), *Signaling, Commitment, and Emotion*, Cambridge/MA
- Fitch, W. T. (2009), Fossil Clues to the Evolution of Speech, in: Botha, R./C. Knight (eds.), *The Cradle of Language*, Oxford, 112–134
- Flack, J./F. de Waal et al. (2005), Social Structure, Robustness and Policing Cost in a Cognitively Sophisticated Species, in: *American Naturalist* 165(5), 126–139
- / — et al. (2006), Policing Stabilizes Construction of Social Niches in Primates, in: *Nature* 439, 426–429
- Foley, R. (1995), *Humans Before Humanity*, Oxford
- /P. C. Lee (1989), Finite Social Space, Evolutionary Pathways, and Reconstructing Hominid Behavior, in: *Science* 243, 901–906

- Frank, R. (1988), *Passion within Reason: The Strategic Role of the Emotions*, New York
- Fraser, B. (under review), Evolutionary Debunking Arguments and the Reliability of Moral Cognition, in: *Mind and Language*
- Fraser, G. M. (2001), *Quartered Safe Out Here: A Recollection of the War in Burma*, London
- Gurven, M. (2004), To Give and to Give Not: The Behavioral Ecology of Human Food Transfers, in: *Behavioral and Brain Sciences* 27, 543–583
- Hrdy, S. B. (2009), *Mothers and Others: The Evolutionary Origins of Mutual Understanding*, Cambridge/MA
- Jeffares, B. (2010), The Co-evolution of Tools and Minds: Cognition and Material Culture in the Hominin Lineage, in: *Phenomenology and the Cognitive Sciences* 9(4), 503–520
- Jensen, K./J. Call et al. (2007), Chimpanzees Are Rational Maximizers in an Ultimatum Game, in: *Science* 318, 107–109
- Joyce, R. (2006), *Evolution of Morality*, Cambridge/MA
- Kaplan, H./P. Hooper et al. (2009), The Evolutionary and Ecological Roots of Human Social Organization, in: *Philosophical Transactions of the Royal Society Series B* 364, 3289–3299
- McBrearty, S./A. Brooks (2000), The Revolution That Wasn't: A New Interpretation of The Origin of Modern Human Behavior, in: *Journal of Human Evolution* 39(5), 453–563
- Miller, G. F. (1997), Sexual Selection for Moral Virtues, in: *The Quarterly Review of Biology* 82(2), 97–125
- Nowell, A. (2010), Defining Behavioural Modernity in the Context of Neandertal and Anatomically Modern Human Populations, in: *Annual Review of Anthropology* 39, 437–452
- Ostrom, E. (1998), A Behavioral Approach to the Rational Choice Theory of Collective Action, in: *American Political Science Review* 92(1), 1–22
- Powell, A./S. Shennan et al. (2009), Late Pleistocene Demography and the Appearance of Modern Human Behavior, in: *Science* 324, 1298–1301
- Prinz, J. (2007), *The Emotional Construction of Morals*, Oxford
- Seabright, P. (2010), *The Company of Strangers: A Natural History of Economic Life*, Princeton
- Shenk, M. K./M. Borgerhoff Mulder et al. (2010), Intergenerational Wealth Transmission among Agriculturalists: Foundations of Agrarian Inequality, in: *Current Anthropology* 51(1), 65–83
- Skyrms, B. (1996), *The Evolution of the Social Contract*, Cambridge
- Smith, E. A./M. Borgerhoff Mulder et al. (2010), Production Systems, Inheritance, and Inequality in Premodern Societies: Conclusions, in: *Current Anthropology* 51(1), 85–94
- /K. Hill et al. (2010), Wealth Transmission and Inequality among Hunter-Gatherers, in: *Current Anthropology* 51(1), 19–34
- Sterelny, K. (2007), Social Intelligence, Human Intelligence and Niche Construction, in: *Proceedings of the Royal Society Series B* 362(1480), 719–730
- (2011), From Hominins to Humans: How Sapiens Became Behaviourally Modern, in: *Philosophical Transactions of the Royal Society Series B* 366(1566), 808–822
- (2012), *The Evolved Apprentice*, Cambridge/MA
- (forthcoming a), From Fitness to Utility, in: Binmore, K./S. Okasha (eds.), *Evolution, Co-operation and Rationality*, Cambridge

- (forthcoming b), Life in Interesting Times: Co-operation and Collective Action in the Holocene, in: Calcott, B./B. Fraser/R. Joyce/K. Sterelny (eds.), *Evolution, Cooperation, and Complexity*, Cambridge/MA
- Tomasello, M. (2008), *Origins of Human Communication*, Cambridge/MA
- (2009), *Why We Cooperate*, Cambridge/MA
- /M. Carpenter (2007), Shared Intentionality, in: *Developmental Science* 10(1), 121–125
- / — et al. (2005), Understanding and Sharing Intentions: The Origins of Cultural Cognition, in: *Behavioral and Brain Sciences* 28, 675–691
- Warneken, F. (forthcoming), The Origins of Human Cooperation from a Developmental and Comparative Perspective, in: Hatfield, G. (ed.), *The Evolution of Mind*, Philadelphia
- /M. Tomasello (2006), Altruistic Helping in Human Infants and Young Chimpanzees, in: *Science* 311, 1301–1303
- / — (2009), Varieties of Altruism in Children and Chimpanzees, in: *Trends in Cognitive Science* 13(9), 397–402
- West-Eberhard, M. J. (2003), *Developmental Plasticity and Evolution*, Oxford
- Worrall, J./G. Currie (1978) (eds.), *The Methodology of Scientific Research Programs*, Cambridge