

Giovanni Boniolo, Gabriele De Anna (eds.)

Evolutionary Ethics and Contemporary Biology

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Reviewed by William J. FitzPatrick, Virginia Tech

This collection of ten essays (several co-authored) by an international group of philosophers and biologists aims to explore the implications of neo-Darwinian evolutionary theory for our understanding of ethics. In keeping with the interdisciplinary spirit of the volume, 'ethics' is here understood very broadly, such that the study of ethics includes everything from philosophical inquiry into the existence and nature of ethical truth and justification to scientific inquiry into the causal origins of human capacities, emotions, and behaviors commonly categorized as 'ethical'. This, combined with the inclusion of treatments of methodological issues in evolutionary biology and surveys of biological work, makes for a wide range of topics and approaches with rather less unity than the label "evolutionary ethics" might suggest. The result is a set of discussions that vary significantly in their philosophical depth and sophistication.

Most of the essays are concerned in one way or another with how far evolutionary theory can go toward 'explaining ethics' in the sense of accounting for the origins of certain human traits: our general capacity for normative guidance, our disposition to engage in evaluative judgment and to feel it to have objective authority over us, our disposition to feel emotions such as guilt or shame, or to adopt familiar social norms or codes involving cooperation, altruism, marriage practices, and so on. From the perspective of moral philosophy, the most interesting question is what implications, if any, our answer to this explanatory question has for normative ethics and metaethics -- and, equally importantly (though typically overlooked), *vice versa*. From a scientific perspective, the explanatory question itself is the focus, the issues being how far evolutionary considerations can go in explaining 'ethical phenomena', what the correct explanations are, and what methodologies to employ in finding this out.

The moral philosopher's concerns make cameo appearances in various places, but are dealt with directly only in three essays, with disappointing results. In a chapter entitled "Is Darwinian Metaethics Possible (And If It Is, Is It Well Taken)?", Michael Ruse argues that Darwinism supports "ethical skepticism" -- something like Mackie's error theory -- while also explaining why the illusion of ethical truth and objectivity persists. The discussion covers no new philosophical ground, however, and the argument is insufficiently developed to pose a serious challenge to opponents.

Ruse begins with the observation that "morality is an adaptation like hands and teeth and penises and vaginas" (16), where 'morality' here refers just to certain empirical

phenomena associated with human social life, such as a capacity and tendency for cooperation. From this he concludes that there are no moral truths: "substantive morality is a kind of illusion" (21). This conclusion does not, of course, follow from the mere premise that some basic capacities and dispositions associated with cooperation are products of evolution, and Ruse recognizes that further argument is needed. Moral realists can grant that the intelligence implicated in moral judgment is a product of evolution (either as an adaptation itself or as a spin-off of mental adaptations, along for the ride), and even that some particular psychological and behavioral tendencies reflect specific shaping by our natural selection history (such as a disposition to philander). They will maintain, however, that just as we can put our intelligence to use in autonomous disciplines such as mathematical logic or high energy particle physics, we can likewise put it to reflective use in discovering truths about how it is good and right to live -- truths that may partly line up with the dispositions that make up our evolutionary heritage, but may also partly fly in the face of them.

There may, of course, be no such truths to apprehend, as the irrealist claims, but this is not supported merely by pointing to evolutionary influences on some of our basic capacities and dispositions. And it would just beg the question against the realist -- though this is standard practice in discussions of evolutionary psychology -- to assume that *all* of our moral dispositions must be attributable to evolutionary shaping mediated merely by similarly shaped 'culture,' as opposed to being partly spin-off effects of our autonomous employment of our rational faculties.

Ruse offers little to cast serious doubt on the realist alternative. He likens ethics to spiritualistic superstition (the belief that people are communicating with the dead), and suggests that just as the true causal explanation of what is really going on in the latter case undermines warrant for belief in chatting spirits, so too evolutionary explanations undermine warrant for belief in moral truths. But this is again just question-begging. We have good reason to believe the undermining causal explanation in the case of spiritualism; as Ruse notes, in some cases otherwise indistinguishable from others, the allegedly communicating departed during the First World War turned out to have been alive in a field hospital the whole time, making it clear that the whole phenomenon is best explained as a trick of wishful thinking and imagination. In the case of morality, however, we have no good reason to suppose that our 'moral dispositions and behavior' are exhaustively accounted for by evolutionary causal explanations (even as mediated by cultural conditioning); and to the extent that they are not, because they are based on evaluative judgments arrived at through autonomous reflection -- e.g., in the case of privately helping distant strangers out of respect for their intrinsic value -- the warrant for belief in moral truths is untouched by evolutionary considerations.

Before leaving Ruse it is worth noting a similar begging of questions in his argument that belief in moral truth is undermined by the fact that evolution could have supplied us with different dispositions, less geared toward sympathy and cooperation. He thinks this contingency is problematic because it shows that had the evolutionary pressures been different we would now have very different moral beliefs; and recognizing this contingency ought to undermine any confidence that our actual moral beliefs are on the

right track. But again, it would do so only if our moral beliefs were generally and exhaustively explained by (culturally mediated) contingent evolutionary influences. If instead many of our reflective moral beliefs are explained by our grasping of moral truths through sound moral reasoning, then it should not bother us that we might have had some different particular dispositions as part of our evolutionary heritage. Insofar as we would still have been moral agents at all, we could still have used our generic intelligence to reason our way to the same basic moral truths, and would simply have had different challenges to overcome where our natural dispositions diverged from them (just as we must, as things are, overcome dispositions toward philandering or xenophobia).

In "The Descent of Instinct and the Ascent of Ethics," Giovanni Boniolo argues plausibly that while Darwin had a theory of the genesis both of the *capacity* to make and apply moral judgments and of the moral *judgments* that we make, we are free to accept the former -- as indeed we should -- while rejecting the latter. This is followed, however, by unfortunate metaethical non-sequiturs, such as the claim that there are therefore "no intrinsically moral behaviors but only moral judgments on behaviors," and "morality and immorality are judgment-dependent properties" (37). It is hard to find an argument for such conclusions in the text, though there is passing mention of Montaigne and Nietzsche. Boniolo seems to take these metaethical conclusions to follow from the above Darwinian claim together with the obvious distinction between *judgments* about behavior and *behavior* itself. But the inference seems just to result from conflating issues. He notes, for example, that moral judgments may vary across cultures and communities even where certain instinctual or non-instinctual behaviors do not. But nothing follows from this except that the behaviors are not automatically and universally *judged* moral or immoral; they may still, of course, *be* intrinsically moral or immoral, as moral realists will claim.

The third chapter in which issues in ethical theory are briefly taken up is "Evolutionary Psychopharmacology, Mental Disorders, and Ethical Behavior," by Stefano Canali, Gabriele De Anna, and Luca Pani. This is really an essay on psychopharmacological methodology, arguing that "drug therapy should take into account the adaptive significance of certain psychiatric symptoms" (111) -- since failure to do so can result in misguided treatments with harmful side-effects -- and that evolutionary considerations also tell against the assumption that "each mental disorder must have one perfectly appropriate cure" to be applied uniformly to all patients. The main discussion is useful and important for the practice of psychiatry, though it has nothing to do with "evolutionary ethics." Unfortunately, the authors try to forge that connection by suggesting that psychiatric norms of mental functioning can be used partly to determine ethical norms, where the psychiatric norms are derived from species-typical natural functional norms, which in turn are supposed to be determined by trying "to figure out what mental properties and capacities an individual must have in order to fall under the concept 'human'" (104).

Here there is appeal in passing to Foot's teleological naturalism, for example, but the philosophical problems with this sort of suggestion are so notorious and deep that nothing helpful can come of a brief discussion at this level. There is a vast philosophical literature

on natural function, for example, most of which makes it clear that any notion of natural function rich enough to support the function/accident distinction, and thus to ground non-arbitrary natural norms of proper functioning, will be geared not toward 'flourishing' as such but toward maximizing one's genetic contribution to the next generation; and this makes it irrelevant to ethical normativity. Psychiatrists do, of course, need a conception of normal mental functioning in order to decide what calls for treatment and what counts as success. But these questions will ultimately have to be answered in part through irreducibly ethical reflection on the human good, rather than through any prior naturalistic (or "purely empirical") account of normal human functioning or consideration of the sortal concept 'human' -- a point the authors seem to recognize in places (106), though it is muddled by the problematic appeal to natural function.

The treatment in this volume of issues in ethical theory is thus unsatisfying. By contrast, there is some interesting and helpful discussion of methodological issues in evolutionary explanation, though it is only indirectly related to evolutionary ethics. In "Are Human Beings Part of the Rest of Nature?", Christopher Lang, Elliott Sober and Karen Strier offer a lucid and rigorous examination of problems associated with evolutionary explanations of human traits -- specifically with determining when explanations of human traits are *unified* with explanations of homologues or analogues in other species, and when they are not (i.e., because different causes have figured into the maintenance or selection of the traits, respectively). They emphasize the need for the right kinds of *variation* within data sets to make for testable causal hypotheses and to avoid a proliferation of 'just so' stories, and this carries lessons for arguments from intra-species and inter-species comparisons. It also raises problems for generating testable causal hypotheses involving traits unique to human beings.

This has implications for evolutionary psychology, which often proposes evolutionary explanations for distinctively human features while taking them to be species-typical universals. To avoid untestable 'just so' stories it would seem to be necessary either to find sufficient human variation after all or to relate the human traits in relevant ways to more basic traits in other species (52-53). And some of the problems discussed earlier come up again here: it cannot just be assumed, for example, that a bit of altruism performed by a human being self-consciously applying Kantian or Christian principles can be relevantly related to 'altruistic' behavior found in non-human animals.

While some of the other chapters are heavy on survey material (and biological jargon) and somewhat light on argumentative development, there are three very strong chapters -- clear, rigorous and philosophically well-developed -- in the final section, by Francisco Ayala, Philip Kitcher and Alex Rosenberg. In "Biology to Ethics: An Evolutionist's View of Human Nature," Ayala offers a clear-headed and refreshingly contrarian perspective on the origins of our disposition to engage in value judgments and norm-governed behavior. On his view, "we make moral judgments as a consequence of our eminent intellectual abilities," rather than as a "sociocultural correlate of behaviors fostered by biological evolution" (156-57). The discussion provides a carefully developed version of Boniolo's main thesis and a nice illustration of a "disunified" account of the explanation of altruistic behaviors in reflective human beings and that of 'altruistic' behaviors in non-

human animals (to borrow the categorization from Lang, Sober and Strier). Such a view construes ethics -- along with literature, art, science and religion -- as an "expression of the high intellectual abilities present in modern humans," where these abilities were favored by natural selection but the particular expressions needn't have been, and needn't be explained even in part by appeal to the causal factors that have generated superficially similar behaviors in other animals (147, 152). While this may go too far in the opposite direction from current trends in evolutionary psychology, it articulates an important possibility for at least some aspects of these expressions of human intelligence, with significant implications for ethical theory, as noted earlier.

Kitcher's and Rosenberg's chapters are perhaps the richest in the collection, and will repay careful study. In "Between Fragile Altruism and Morality: Evolution and the Emergence of Normative Guidance," Kitcher provides a sophisticated and original account of how the human capacity for normative guidance may have arisen in hominid evolution. Roughly, the idea is that a genuine but fragile psychological altruism (involving "a blind tendency to respond to the preferences of another animal with whom you might engage in cooperative activity") evolved as an adaptive strategy in the context of "coalition games," where calculation is infeasible; yet because these altruistic dispositions were fragile and partial, there was always a threat of social rupture and consequent loss of cooperative advantage, requiring costly investments of time and energy in peacemaking, which in turn kept the bands fairly small and limited their range of cooperative ventures. Kitcher's hypothesis is that a capacity for emotionally laden normative guidance then evolved because it offered, through the social development of rules of group loyalty, a solution to the problem of social fragility and resource-wasting peacemaking, reinforcing altruistic tendencies and allowing for larger and more broadly cooperative groups. The discussion, while speculative, is nuanced (with helpful distinctions between various types and dimensions of altruism, for example) and lends support, among other things, to Gibbard's account of normative governance in developing his expressivist metaethics (though the two can of course be separated).

Finally, in "Will Genomics Do More For Metaphysics Than Locke?", Rosenberg takes up the problem of proliferating 'just so' stories mentioned earlier, and argues that comparative genomics offers the best hope for truly testable hypotheses about the evolution of human traits such as cooperation. He begins with an illuminating and accessible discussion of how comparative gene sequencing can turn otherwise speculative questions about recent human prehistory into testable hypotheses -- e.g., about the existence of an 'African Eve' 144,000 years ago, patterns of human migration, and the origins of agriculture in Europe 10,000 years ago (due, according to the genomic evidence, not to cultural evolution but to the displacement of the indigenous population by farmers from the Near East). In the search for data about the origins of human cooperation, the proposal is that "positional gene cloning" in connection with hereditary and genetic defects (such as autism) might be used to identify gene sequences for relatively simple phenotypic components subserving complex cooperative behaviors; this would then allow for comparative computational genomic studies (e.g., with chimps, or with preserved DNA from hominids) to shed light on when and how cooperation evolved, in ways Rosenberg again illustrates very nicely.

In summary, though the quality of the volume as a whole is mixed, and it will likely prove disappointing to those interested in evolutionary ethics from the philosophical perspective of ethical theory, it contains some very fine essays that will be of use to those interested primarily in the scientific explanation of phenomena associated with human social life.

See, for example, John McDowell, "Two Sorts of Naturalism," in R. Hursthouse, G. Lawrence, and W. Quinn (eds.), *Virtues and Reasons* (Oxford: Oxford University Press, 1995), 149-180; and William J. FitzPatrick, *Teleology and the Norms of Nature* (New York: Garland, 2000).

See Allan Gibbard, *Wise Choices, Apt Feelings* (Cambridge, MA: Harvard University Press, 1990).

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Introduction

GIOVANNI BONIOLO AND GABRIELE DE ANNA

A long-standing interest in how biological evolution and ethics relate to each other has focused on the relevance of evolutionism (and subsequent naturalism) to the existence and status of moral values and to the character of moral agency. Discussions regarding the relevance of biology to ethics date back to Aristotle, and when the concept of evolutionism first appeared, it was immediately taken to have important bearings on moral thinking (Maienschein and Ruse 1999). Yet, it was not until the end of the nineteenth century that the interest in these issues really bloomed. More recently, the explanatory and academic success of the “new” biological sciences, such as molecular genetics, ethology, neurobiology, and neuropsychology, opened up promising possibilities for a more profound comprehension of human behavior, including normatively guided agency. Moreover, current debates seem to show that only an integrated contribution of all these sciences can shed light on human agency. Thus, philosophers are now becoming increasingly interested in questions such as whether and how ethics relates to our biological nature, and whether and how aspects of human biology bear upon our social practices.

Within these debates, increasingly pressing questions concern the relevance of recent developments in contemporary biological sciences in furthering our understanding of the relationship between evolutionism and ethics. The problem then arises of understanding how these issues can be correctly framed in philosophical terms. This collection of original essays offers a cutting-edge coverage of the topic and suggests some possible answers.

An attempt to offer a philosophical framework to discuss the idea that evolutionism may be relevant for ethics must face two problems: it should

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highlight what sort of contribution evolutionism offers to ethics; and it should characterize precisely what ethics is, that is, what kind of behavior can be called ethical behavior.

Concerning the first issue, there are two main sorts of contribution that evolutionism can offer to ethics. On the one hand, evolutionarily oriented biological sciences can be employed to develop an *explanation* of ethics, in particular, an account of the reasons why ethics exists and has the features it does. On the other hand, biological sciences can be used to offer a *justification* of ethics, namely an account of the reasons why ethical statements are normative and should be followed.

All views affirming that biological sciences have a role in explaining and/or justifying ethics can be broadly called naturalistic. But naturalism comes in different degrees, depending on what the contribution of sciences is claimed to be, and on whether that contribution involves only justification, only explanation, or both. For example, a weak form of naturalism sustains the idea that science is one of the many useful sources to explain and/or justify ethics but accepts that the latter cannot be reduced in any sense to the former. A second, stronger form of naturalism supports the view that science can explain ethics but cannot justify moral discourse. A third, even stronger approach maintains that naturalism concerns the possibility that ethical normativity can be fully explained and justified scientifically. Thus, moral discourse can be reduced to scientific discourse, yet still preserve its colloquial autonomy.

This threefold distinction between different degrees of naturalism is not exhaustive, because different views on the relationship between justification and explanation can complicate the issue. For example, one may contend that, once science has explained all the facts concerning human behavior, including human sentiments and the sense of duty, it is impossible or unnecessary to justify ethics. Ethical discourse will then be viewed as merely fictitious. It seems, in this context, two different lines are possible: an extreme form of naturalism, which sustains that moral discourse has to be eliminated; or a less extreme form, which maintains that moral discourse cannot be renounced, although it is merely illusory.

Let us now turn to the second problem in offering a philosophical framework. What is ethics? What is the object that we hope to explain and/or justify through biological sciences? From a scientific standpoint, ethics can be seen as a particular sort of behavior, typically exhibited by humans, that involves the consideration of norms. Probably the best way to frame this kind of behavior is the multilayered account of human agency recently proposed by Rottschaefer (1998). His model of moral behavior comprises four levels: first, a level of minimally cognitive moral capacities, which are biologically

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[More information](#)*Introduction*

and psychologically founded; second, a behavioral level, involving cognitively acquired moral beliefs and desires, which give rise to moral behavior; third, a reflexive level, concerning moral beliefs and desires about second-level behavioral beliefs and desires, that is, moral norms; and fourth, a self-referential reflexive level, in which a moral agent conceives of himself as a moral agent.

Rottschaefer's analysis suggests that human moral behavior involves two main objects, which biological sciences should help us explain and/or justify: the set of cognitive and emotional traits, which is needed in the four levels and which constitutes what we could call the "human moral capacity"; and the sets of rules or norms (to be empirically identified), which are employed in human agency at levels three and four and which we call "ethical systems."

This distinction further complicates the possible shades of naturalism, because it combines with the justification-explanation distinction and generates a matrix of possibilities. Indeed, one may think that evolutionism may explain and/or justify either the human moral capacity only, ethical systems only, or both.

The chapters in this volume touch upon these two main issues. Chapters in the first part deal with the justificatory and explanatory possibilities (about ethics) of evolutionism. The second part concentrates on some methodological aspects that are central for all attempts to explain and justify ethics. The third part focuses on how recent findings in various biological sciences may help explain the human moral capacity. The fourth part focuses on how recent scientific results may contribute to the explanation of moral systems.

Most of the authors agree with a weak form of naturalism, which claims that evolutionism fails to justify ethics, although it may explain some features of it (which is why the third and the fourth parts are entirely devoted to the problem of explanation). Some suggest an even weaker form of naturalism. According to Boniolo, for example, evolutionism may explain the enabling conditions for the human moral capacity but not ethical systems. Canali, De Anna, and Pani, to offer another example, think that evolutionism can certainly contribute to the explanation of some human ethically relevant cognitive capacity but only in conjunction with other nonbiological considerations.

In the opening chapter, Michael Ruse discusses the main metaethical question raised by evolutionary ethics: can evolutionism justify morality? He distinguishes this metaethical question from the problem of normative morality, that is, what norms we ought to follow. He contends that normative morality can be successfully explained by evolutionism and that this explanation is a matter of empirical results coming from different sciences. When it comes to justify our substantive moral norms (i.e., to point out their foundations, the

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things that make them compulsory, the reasons why we have to follow them), the concern becomes metaethical and is a matter of philosophical (rather than empirical) investigation. According to Ruse, on the metaethical level evolutionism leads to skepticism, which entails a form of metaethical antirealism. Evolutionism highlights that there are no foundations for our moral norms, because they are the mere result of our evolutionarily originated moral sentiments. Against sociobiologists, Ruse contends that evolutionism cannot offer a justification for normative morality, because evolution itself is not a value, nor does it follow a direction that might be evaluatively qualified as progressive. Evolution, indeed, could have taken a different direction, and we could have ended up with different moral sentiments and, thus, with a different normative morality. Hence, there is no basis for the claim that our moral norms have to be followed. This is not to deny the grip of normative morality on us. The point is that this grip is the mere result of an illusion. Against traditional twentieth-century forms of emotivism and perspectivism, though, Ruse contends that the illusion concerns also the very objectivity of the contents of moral norms. Furthermore, the illusion cannot vanish, because it depends on moral sentiments that were entrenched in our psychology by evolution. The resulting view is a Humean form of moral sentimentalism combined with Darwinian evolutionism.

Giovanni Boniolo, in the second chapter, seems to take a similar stand on the metaethical level, because he claims that moral behaviors are totally judgment-dependent and that certain kinds of relativism must be accepted, even if “anything goes” forms of relativism should be rejected (e.g., epistemological relativism must be accepted, but existential relativism should be rejected). These views seem to recall Ruse’s contention that moral judgments are illusory and that particular moral systems cannot be justified by evolution (and, thus, cannot be justified at all), even if we cannot avoid being in the grip of one of them. However, Boniolo seems to disagree with Ruse on the hopes for an evolutionary explanation of ethics. Whereas Ruse subscribes to his long-standing defense of a naturalistic explanation of normative ethics, Boniolo claims that the evolutionary approach can explain the genesis of the enabling conditions for the human moral capacity but not the diversity of ethical systems. Ruse’s version of naturalism, thus, is rather weak. Boniolo introduces the distinction among *behavior*, *moral judgment on behavior*, and *moral capacity* (i.e., the capacity for both formulating and applying moral judgments on behavior, and for acting accordingly). By starting from this distinction, he shows that Darwin had both a theory of the genesis of the moral capacity and a theory of the genesis of the different moral judgments. Only the moral capacity can be naturalized via evolutionary biology, while moral

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[More information](#)*Introduction*

judgments and moral systems cannot, even if some contemporary authors suggest such a possibility. Boniolo's aim is to offer an explanation of moral capacities that follows directly from Darwin's theory of evolution and is compatible with a form of moral (phylo)genetic relativism. As a conclusion, he states that moral capacities have to be considered as an accidental evolutionary outcome that was made possible by the evolution of suitable cerebral-mental traits. Contrariwise, the formulation and the application of moral judgments are purely matters of human culture, which cannot be explained by biological sciences.

Attempts to explain and/or justify ethics assume that humans (and their behavior) can be the object of scientific considerations from an evolutionary perspective, just as all other living beings. But can humans be considered in this way? And, if so, to what extent? This issue is discussed in the chapters of the second part of this volume.

Whether and to what extent humans are part of nature is discussed by Christopher Lang, Elliott Sober, and Karen Strier. Obviously, in order to discuss the relations between biology (which offers a representation of nature) and human beings, we must be extremely clear whether, and in which sense, humans belong to nature. This is particularly relevant when ethics is concerned: evolutionary explanations of ethics can be accepted only if humans and their activities (including ethically guided behavior) are parts of nature in a relevant sense. In developing this point, the authors distinguish between unified and disunified explanations of human features. Unified explanations seek to situate the traits of human beings in a causal framework that can also explain the trait values found in nonhuman species. Disunified explanations claim that the traits of human beings are due to causal processes that are not at work in the rest of nature. The chapter outlines a methodology for testing hypotheses of these two types and draws implications concerning evolutionary psychology, adaptationism, and antiadaptationism. The suggested methodology does not concern moral behavior exclusively but also has fundamental consequences for evolutionary ethics, as the authors recognize.

Besides establishing in which sense human beings are part of nature, investigators must face another extremely relevant methodological aspect: what is the real value of the comparisons between human and nonhuman animals? Although most discussions on the evolutionary status of moral capacities and moral systems are grounded on comparative analyses of human and nonhuman behaviors, are such analyses really well grounded? This topic, which is fundamental for a better comprehension of the relations between evolutionism and ethics, is discussed in the chapter by the neurobiologist Aldo Fasolo. Explanations of human cognitive capacities (including moral capacities) often

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[More information](#)*Boniolo and De Anna*

rely on analogies with capacities of other animals. Such analogies, however, need to meet precise methodological constraints. To what extent are humans similar to other animals? To what extent can we apply to humans models that we have developed for other animals? In contemporary comparative neurobiology, homology is fundamental for any attempt to offer a neurobiological explanation of human behavior. Fasolo offers criteria that may be useful in distinguishing genuine biological correspondences from loose metaphorical representations in descriptions of human behavior proposed by evolutionary ethicists.

With the fifth chapter, by Giovanni Boniolo and Paolo Vezzoni, we enter the third part of the volume, which focuses on genetic and evolutionary explanations of the human moral capacity. Boniolo and Vezzoni, starting from the antireductionist claim that not everything is in our genes, argue that we cannot overlook that *something* is in our genes. The problem is to understand what that is and to what extent it can constrain our moral capacity. Therefore they investigate in which sense, in some deviant cases, an agent's moral capacity is genetically influenced. Nevertheless, they do not support the idea that genetics morally assesses these deviant cases: genetics does not at all offer the grounds for any moral judgment. They conclude that even if we know, by studying monogenic and polygenic diseases, that our genes, in particular their deviant forms, influence our moral capacity by acting on its enabling conditions, there is not enough scientific ground yet to state in which degree these influences occur.

The sixth chapter, by Stefano Canali, Gabriele De Anna, and Luca Pani, also deals with abnormalities of human behavior. The authors discuss the relevance of evolutionary considerations for psychiatric diagnosis and treatment: psychiatry cannot renounce the notion of the normal functioning of human beings, because the very requirement of a treatment presupposes that the situation to be treated is abnormal and needs to be normalized. However, evolutionary considerations show that the "normal functioning" of a human being is a notion that needs to be tailored to each individual. Generalizations on what is a normal human being are needed, but they subsequently need to be readjusted in light of the particular (genetic and environmental) situation of each individual. When these genetic and environmental situations are considered, kinds of behavior that would otherwise seem pathological may turn out to have an evolutionary significance and thus to make the individual more apt to its environment. Therefore, evolutionary-based psychiatry can help to determine what kinds of human behavior are normal and what kinds are abnormal. In this way, it can help *explain* what the human moral capacity is: that is, what particular cognitive and emotional trait must characterize a

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0521856299 - Evolutionary Ethics and Contemporary Biology

Edited by Giovanni Boniolo and Gabriele de Anna

Excerpt

[More information](#)*Introduction*

normal human being having a complete mastery of his moral agency. (In passing, the authors also hint at a possible line to be taken if one wants to use the notion of human function also to *justify* ethical behavior.) Although their view is in a sense naturalistic, the form of naturalism suggested by the authors is quite weak: in their view, evolutionarily based neurological and psychiatric considerations can provide only some of the considerations that need to be taken into account when determining what normal human behavior and the moral capacity are. In other words, human behavior and moral capacity can only be partly explained by evolutionary psychiatry.

The essay by Parmigiani, De Anna, Mainardi, and Palanza, the seventh chapter of the volume, considers the contribution of ethology to the explanation of ethics. The authors contend that ethological considerations clearly show that several ethically relevant sorts of behavior do not depend entirely on culture but have strong inherited bases. Indeed, several emotional and cognitive traits, which lead to certain sorts of behavior, clearly represent a universal human heritage and have an evident evolutionary significance, because they follow the “selfish gene” pattern of evolution. The authors consider the cases of infanticide and of male jealousy for females. They are so widespread among human populations that it makes sense to speak about a “universal human nature.” The authors, however, consider some examples of ethical systems that do not conform to the selfish-gene pattern of evolution or prescribe the kinds of behavior that should be expected from our emotional and cognitive traits (e.g., most contemporary ethical systems claim that infanticide is wrong). This suggests that considerations based on evolutionary ethology can explain the origin of certain human emotional and cognitive traits but cannot explain the origin of moral systems, which depend on culture. Although there may be selective pressures on cultures, the evolution of moral systems does not seem to follow the same patterns of biological evolution. In this way, the authors confirm a conclusion already supported in other chapters included in this collection (e.g., Boniolo’s), even if they suggest that biological evolution and cultural evolution may constitute a continuum.

The eighth chapter, by Francisco Ayala, opens the last part of the volume. Ayala tries to offer an account of ethics that can preserve both the not fully naturalistic outlook of sets of norms that he previously proposed (Ayala 1995) and the need for an evolutionary explanation of the reasons why certain sets of norms developed. Ayala suggests that in humans there are two kinds of heredity: the biological and the cultural. Biological inheritance is based on the transmission of genetic information from parents to offspring, very much the same in humans as in other sexually reproducing organisms. Cultural inheritance, on the other hand, is distinctively human, based on transmission of

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Excerpt

[More information](#)*Boniolo and De Anna*

information through a teaching and learning process, which is, in principle, independent of biological parentage. Cultural inheritance makes possible the cumulative transmission of experience from generation to generation. Ayala claims that cultural heredity is a swifter and more effective mode of adaptation to the environment than the biological mode because it can be designed. The advent of cultural heredity ushered in cultural evolution, which transcends biological evolution. The chapter ascertains the causal connections between human ethics and human biology. Ayala's conclusions are that the proclivity to make ethical judgments, that is, to evaluate actions as either good or evil, is rooted in our biological nature, a necessary outcome of our exalted intelligence. On the other hand, the moral codes that guide our evaluations of actions are products of culture, including social and religious traditions. This second conclusion contradicts evolutionists and sociobiologists who claim that the moral good is simply that which is promoted by the process of biological evolution. Ayala thus rejects strong forms of naturalism about the evolutionary explanation of moral systems. Moral codes and, hence, our self-referential reflexive moral understanding are the result of cultural heredity. In this way, cultural evolutionism can hope to explain ethical systems. A justification of ethical systems, though, is still needed.

Philip Kitcher, in the ninth chapter, offers an explanation of the emergence of ethical systems based on ethological information regarding altruism among primates and on considerations concerning the adaptive advantages of the reinforcement of altruistic behavior. Primitive hominids probably lived in social groups rather like those of contemporary chimpanzees and bonobos, groups in which fragile altruistic dispositions were often overridden and in which peacemaking strategies were constantly needed. Kitcher suggests that we can understand the emergence of morality in terms of an ability to reinforce these altruistic dispositions, and that this made it possible to evolve both larger group sizes and a richer array of cooperative projects. He explores this suggestion in the context of what we know about human evolution and about the moral systems that first appeared in the historical record. Altruism is one of the most intensely discussed topics in the literature on evolutionary ethics, to which Kitcher has already offered fundamental contributions. The reasons for the popularity of altruism certainly lie in the fact that it is the most obvious example of a subject that can be studied both in animal groups and in most human moral systems. However, altruism is a difficult starting point for evolutionary ethics, because it does not normally allow one to see a clear and empirically supported line of development toward a full explanation of human morality. In this respect, Kitcher's chapter offers an original contribution, in that his model of the reinforcement of altruistic dispositions

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opens up the possibility of finding a full-fledged explanation of ethical behavior.

It is worth noting that Kitcher's conclusions contrast with those reached by Parmigiani et al. We then face the problem whether evolutionism can explain ethical systems as well, or only the human moral capacity. Kitcher's considerations on altruism suggest the former, whereas Parmigiani et al.'s considerations on infanticide the latter. This opens a set of questions that this collection cannot settle, but which ethologists and philosophers should discuss. In order to settle the dispute, we need to understand whether the evolutionary advantage of altruism is greater than the evolutionary damage of renouncing infanticide.

In the tenth and final chapter, Alex Rosenberg discusses some of the empirical evidence already discussed by Boniolo and Vezzoni and offers an alternative and novel way of making a philosophical use of the relevant variation correspondences. He suggests that comparative gene sequencing is the only possible source of evidence that could change the interesting and imaginative "just-so stories" of evolutionary game theory into a scientifically confirmed chronology of how cooperation, altruism, sociality, and moral conduct evolved among humans. He argues that prospects for some illumination from this source are not negligible, given the advances in the sequencing of ancient DNA and comparative genomics with our chimpanzee cousins. Rosenberg's comprehensive chapter is an ideal conclusion for the volume, because it shows how different sciences can be integrated in an account of the origin and nature of most of those human capacities which are involved in moral behavior, at all four levels of moral agency. The question still remains whether that account not only explains but also justifies moral norms.

As a final remark, we hope that this collection of essays offers a fully comprehensive and up-to-date picture of the philosophical problems concerning the relations between ethics, evolutionism, and contemporary biological sciences. The collection suggests that moral discourse cannot be eliminated, and that even a mere reduction of morality to sciences is highly problematic. Nonetheless, it shows that scientific findings are relevant for our understanding of all aspects of morality, both the issues concerning our moral capacities associated with the lower levels of the suggested model of moral agency and the higher levels related to our everyday understanding of moral obligations and our moral self-conception. But there is a further, maybe more important reason for which this collection may be useful. The present essays offer methodological reflections on, and actual examples of, the ways in which scientific findings can be used as evidences for a philosophical explanation of human moral behavior. We hope that this will benefit both philosophers and

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scientists. Philosophers of all persuasions, not only naturalistically minded philosophers, might well see that scientific findings can be usefully adopted in their work on ethics, without the risk of introducing (potentially question-begging) heavy naturalistic assumptions that might lead to a deflationary conception of ethics. Scientists might notice how problematic and moot are the philosophical bearings of their results and may appreciate what sorts of empirical evidence is expected from their work for philosophical purposes.

Some may question the scope of the volume because most of the chapters focus on the evolutionary *explanation* of ethics. The problem of justification, indeed, seems to have been dismissed in the first two chapters on purely skeptical grounds. In truth, the issue of justification remains an open question, and, although most of the authors seem to agree that evolutionism cannot justify ethics, it cannot be *prima facie* excluded that nonevolutionary, nonskeptical justifications of ethics may be coherent with the explanations advanced here. Moreover, it may even be the case that these explanations can be employed in some attempts of justification that do not rely on evolutionism but are naturalistic nonetheless. For example, recent natural-law attempts to justify ethics – such as those by Philippa Foot (2001) and Mark Murphy (2001), which rely on facts concerning human nature as reasons for actions that may justify ethical systems – may find in the explanations of human moral capacities and ethical systems here presented important insights for the understanding of human nature. It is our hope that these essays may also be of some interest to those working on justificatory projects of this kind.

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