

7 | *Nature's Purposes and Mine*

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Whether or not we find what we are seeking
Is idle, biologically speaking.

– Edna St. Vincent Millay

No thank you. I don't think nature intended us
to drink while flying.

– *Passenger refusing a drink in Gardner Rea cartoon*

“What is by nature proper to each thing,” wrote Aristotle, “will be at once the best and the most pleasant for it” (1984b, pp. 6–7). This chapter may be described as a meditation on the question of what can be made of Aristotle's sunny optimism in a post-Darwinian age.

Aristotle's maxim immediately raises four questions. First, given that philosophers have long attempted to elucidate ways in which humans *transcend* nature, what does it mean to say that anything is “by nature proper” to us? Second, talk of bitter medicine and mottoes such as “no pain, no gain” suggests that Aristotle is here at odds with common sense. Why should what is best be expected to be also most pleasant? Third, best and most pleasant for whom? Because we are social beings, as Aristotle himself famously stressed, should the maxim not be supplemented by a reminder that what is best and more pleasant for you might be neither for others? Even if strictly correct, the maxim would be of limited use to one who wishes to be a good citizen as well as a happy child of nature. And fourth, just what is the relevant sense of “a thing” in the maxim as we might now understand it? We are composites of living parts, and controversy has raged over the question of what “thing” we should be talking about when we discuss what is “best”: species, populations, groups, individuals, cells, genes, even mitochondria, and “all of the above” have been candidates for the role of beneficiaries or “units” (whether these be equivalent or not – also matter of dispute) of natural selection.

All these questions are pertinent to what follows, if only implicitly, but I will be more narrowly concerned with the questions of how biological knowledge can have a bearing on our philosophical conception of ourselves as human beings. This question can be regarded from a metaphysical point of view and from the point of view of ethics broadly conceived. I care mostly about the latter, for although a philosophy of the human person can't avoid being metaphysical, I am not interested in the sort of metaphysics that has no conceivable relevance to how we should live. Barring speculation about the possibility that quantum effects in microtubules might enable and explain free will (Penrose 1994), for example, it is unlikely that facts about the inner constitution of the atoms of which we are made will have philosophically interesting consequences. There is a slightly higher likelihood of philosophical payoff in the fact that we are made of cells, the ancestors of which lived solitary lives for one or two billion years before teaming up to form multicellular organisms. More clearly pertinent is the scientific refutation of the popular belief that individual consciousness will survive the annihilation of the brain, though what we should infer from this about how to live is less obvious. The philosophical tradition contains a wide variety of possible attitudes to mortality ranging from a cheerful endorsement of Epicurean *carpe diem* to nihilism about value. At the end of this chapter I shall ask some concrete questions and hazard controversial answers concerning what biology and psychology might teach us about our traditional ideologies of love and sex. But I begin with an old controversy concerning the very idea of inferring anything about value from natural facts.

Nature and the Naturalistic Fallacy

Many of us were brought up to think that there is something called a “fact-value” or “is-ought gap” and that any attempt to bridge this gap commits the “naturalistic fallacy.” While it would be tedious to go over the debates that have swirled about this claim, it is worth noting that the existence of such a fallacy would entail that no justification of ethics is possible. To see why, consider the ambiguity of the word “nature” as neatly encapsulated by J. S. Mill:

In the first meaning, Nature is a collective name for everything which is. In the second, it is a name for everything that is of itself, without human

intervention . . . while human action cannot help conforming to nature in one meaning of the term, the very aim and object of action is to alter and improve nature in the other meaning. (Mill 1874, p. 12)

In the sense in which “we cannot help conforming to nature,” the reference is simply to the totality of facts about the actual world. That (call it N_1) includes everything that humans bring about. Mill’s second sense (call it N_2) is the status quo, which it is the aim of any action to modify. The difference between N_1 and N_2 is the sum of everything that we actually do. Call it A for “action.” Some members of A are things we ought to do. Other members of A are things we should have refrained from doing, and still others are deontologically and axiologically indifferent. Because values can conflict, a single action, event, or situation might be positioned differently on different evaluative dimensions. Recall E. M. Forster’s famous remark, “If I had to choose between betraying my country and betraying my friend, I hope I should have the guts to betray my country” (Forster 1951, p. 68). Caring for one’s friends and caring for one’s country represent different values, differently correlated with other scales of value, depending on the priority accorded to individuals or community. But what justifies such judgments? Where should we seek *reasons* for claims about values?

By hypothesis, N_1 refers to all actual facts. N_2 , by contrast, lists only facts that existed before we acted, as well as counterfactual possibilities that would have been actual had we not acted. If no normative statement can be derived from any statement of fact, then no normative proposition can figure in either N_1 or N_2 .¹ So what, if not a fact (for all facts are contained in the union of N_2 and N_1), can constitute a *reason* to justify a normative claim? If that reason cannot consist of any *facts*, must it consist of some nonfact?

Unless the question is rhetorical, we presumably have in mind something other than mere falsehoods (although many moral precepts may well rest on nonfacts in precisely that sense – nonfacts about God and his commands, for example). What other nonfacts could there be?

A vigorous philosophical tradition, going back to Hume’s distinction between matters of facts and relations of ideas (Hume 1975),

¹ For the purposes of this chapter, I make no distinction between norms, “oughts,” and values. “Normative” is used generically for anything that faces facts across the alleged gap.

distinguishes empirical facts, discoverable only by experience, from *a priori* truths, which owe their status to logic or meaning alone. But logical or analytic truths, even though they are not always transparent to intuition, are unlikely to entail claims about the desirability of some ways of life over others or about the rightness of some actions and the wrongness of others.

In short, no normative statements can be justified at all unless we relax the constraints on the range of statements admissible in their support. One way to relax those constraints is to select a normative major premise so mild that it might command universal assent. In past ages when all could take religious belief for granted, the precept that one ought to follow God's command might serve, though securing agreement on the content of such commands was another matter. In a postreligious age such as we might optimistically assume ourselves to have reached, by contrast, basic facts about us, such as biology might disclose, might constitute the privileged class of facts apt to provide guidance about how to live.

But among the myriad facts of biology, which are we to select for inclusion in that privileged class? What biology teaches about the sorts of beasts we are can be viewed in either a minimalist or in an expansive mode. A minimalist interpretation would collect only facts about what is possible. A person might run a mile in four minutes, but no one can leap unaided over tall buildings. Morality can neither require nor forbid the impossible, and if we are to get guidance from natural facts about what is possible, these will have to be characterized more expansively as not only possible but also more or less conducive to a worthwhile life. If we all agreed on what counts as a worthwhile life, we might hope to find novel and relevant knowledge in evolutionary theory, psychology, and brain science.

There are many working illustrations of how useful such knowledge could be if one could only persuade politicians to take it into account. Recent books by Patricia Churchland (2012) and Sam Harris (2011) have attempted to do just that. Both have been accused of attempting to leap across the fact-value gap, oblivious to the philosophers standing guard to stop them. But if we grant a broad consensus on certain basic values, such as autonomy, happiness, and the development of capabilities conducive to the realization of these values, biological and social sciences offer much information to improve the lot of human beings (Nussbaum 2000). There is increasingly compelling evidence, for

example, that poverty is bad for your health, and extreme inequality is correlated with a slew of other social ills (Wilkinson and Pickett 2010; Atkinson 2015). From a philosophical point of view, however, any argument premised on facts such as these remains an enthymeme, and its silent evaluative major premise is of just the sort that antinaturalists reject, namely, that human thriving and happiness are inherently good and that pain and unjustified coercion are inherently bad. We must either renounce the enterprise of justifying any statement of value or else relax the strictures imposed by the nonnaturalist principle that bans any inference from fact to norm or value.

Relaxing the Prohibition Against Naturalism

How would such a relaxation work? I see two ways, based on different principles for selecting a privileged class of facts that straddle the fact-value distinction. The first treats values as response-dependent properties and looks for the privileged facts among human emotional responses. The second, which has a much longer pedigree, privileges certain facts about nature as representing not merely what happens but what is *supposed* to happen.

On the first option, the values of existing things in the world are something like “Cambridge properties,” not inhering in the world but derived or projected from properties inhering in something else, namely, human responses. These are, of course, facts about human beings, but on this view they do not presuppose the independent objective reality of value. Hence they can count as reasons for judgments of value. The appeal to emotional responses illustrates the subjectivist response to the question raised in Plato’s *Euthyphro*, whether we prefer things because they are inherently good or whether good is so-called because it is preferred. Variants of this proposal have come to be known as “sentimentalism” (Kauppinen 2014). There are two things to note about it. First, while the privilege accorded to actual emotional responses is a form of relativism, it is not incompatible with the objectivity of the value properties in question. This is so for two reasons. First, although the responses that constitute the privileged class of facts are subjective states, the fact that they occur is an objective fact about observers. Their occurrence can be assessed from an axiological point of view. Second, on the model of Locke’s view of the relationship between secondary qualities and the primary qualities that

underlie them, we can postulate some inherent properties of the world that normally give rise to the responses in question. Those too are objective, but they are not inherently value laden. To be yellow is not to have a determinate property defined in terms of any specific light frequency but to have the capacity to produce, in normal viewers under normal circumstances, the impression of yellow. Yellowness supervenes on objective properties that are not identical to it. Because circumstances can be abnormal, this allows for mistakes and illusions. Similarly, the view that ethical properties are response dependent allows us to regard them as both relative and objective.

But relative to what? The question leads to a second way of relaxing the nonnaturalists' strictures. This is the principle of "natural law," which goes back to Aristotle and Aquinas and still forms the basis of most of the edicts that come out of the Vatican. It is also advocated, among contemporary philosophers, by "virtue theorists" (Hursthouse 1998). Virtue theory posits a substantive equation between the good, the pleasant, and the thriving in the spirit of Aristotle's observation with which I began. Although it is not clear whether virtue theory requires us to believe in objective, human-independent moral truths, it does seem committed to the existence of a universal human nature.

But how can we discover what human nature, in the relevant sense, actually consists of? The answer to this question, which constitutes the key move of natural law theory, in effect promotes statistical norms to a normative status, on the basis of Aristotle's criterion that what happens "always or for the most part" is what nature intends (Aristotle 1984a, Met. 1027a20). The strategy is bait and switch, playing with the ambiguities in both the words "nature" and "law." It relies for its normative force on making sense of the idea that not everything in the set of facts N_1 is good: certain things that actually occur in nature are deemed *unnatural*, aberrations of nature rather than what nature "intended." The "bait" is the promise that nature itself will somehow reveal what it "intends," allowing us to uncover its laws in the sense in which that term is understood in science. The "switch" occurs when encountering exceptions to the alleged law: instead of regarding these as falsifications of a hypothesis, the natural law theorist condemns them as normatively unacceptable on the basis of their incompatibility with that "law" – thus begging the question by switching from the scientific to the legislative use of the word.

Despite its theological component, Aquinas's modification of Aristotle's scheme is more congenial to the modern mind than Aristotle's own. Aristotle thought that teleology was inherent in nature, without any need for an intelligent intention to explain it. Whether this applies to nature as a whole is controversial (Broadie 2007), but it certainly applies at the level of individual organisms, regarded as members of a species with a fixed nature. If teleology is inherent in nature itself, then we should be able to derive at least some normative statements from those natural teleological facts. But despite recent attempts by Thomas Nagel to resuscitate the notion of a natural teleology without intelligent design (Nagel 2012), that idea now strikes most of us as unintelligible. So the assimilation of the designs of nature to the purposes of God makes it easier to accept that nature actually has intentions. Its drawback is that it requires those not privileged to read God's mind to decipher those intentions from the empirical facts around us.

As Ruth Millikan (1984, 1993) and others have shown, the concept of objective teleology – independent of human interests and purposes – does not require intelligent design after all. Natural functions can be identified with those effects of an organ's activity that resulted in its being selected for and hence explain its present existence. Though refinements and objections have not been lacking (Allen, Bekoff, and Lauder 1998), I venture to think that the etiological explication of natural function marks one of the few genuine advances in philosophy in the past hundred years. But it does not answer the crucial question of what natural functions we should endorse as valuable and which ones we should regard – in the words of Katherine Hepburn's character in the movie *African Queen* – as “what we are placed in the world to rise above.” Or rather, it does answer the question for natural law theorists. But it does so quite arbitrarily, in much the way that self-proclaimed biblical literalists interpret some pronouncements as the word of God, such as the prohibition of homosexuality, while dismissing others – such as the permissibility of selling your daughter into slavery – as reflecting mere accidents of history.

We may come to think better of natural law theory on the day that the Vatican reverses its ban on homosexuality after noticing the existence of gay penguins, but even that policy, taken to its logical conclusion, would lead only to the equally rebarbative endorsement of the doctrines of the Marquis de Sade. For the “divine Marquis” proved

himself to be the only consistent naturalist philosopher by scrupulously following every natural inclination (Sade 1810). Just as we cannot avoid making choices among different elements of N_1 , so we cannot evade specifying the criteria on which such choices are made.

The fact that some process serves an objective function does not imply that we should value it. Conversely, the fact that a capacity lacks a natural function is no reason not to prize it. Consider male and female orgasms. While the male orgasm serves reproduction by the ejaculation of sperm, the female orgasm does not appear to have any clear function. Like male nipples, it arises primarily as a side effect of the homology between the penis and the clitoris (Lloyd 2005). One indication of this is that among some of our relatives, such as the rhesus monkey *Macaca mulatta*, female orgasm has been shown to be possible but extremely unlikely ever to occur in the wild (Burton 1971). This implies that it cannot have been visible to natural selection and hence cannot have been selected for. Unlike male nipples, however, female orgasm has value. Some of the best things in life are spandrels.

One last reason for dismissing natural law theory is that Aristotle's criterion makes sense only if species remain unchanged. Applied to evolving species, it entails that millions of our ancestors must be condemned as perverts. For among our ancestors, all those that came a step closer to being human necessarily were exceptions to whatever was true "always or for the most part" of their peers. Human beings are descended from millions of freaks. If all our ancestors had been normal, we would be unicellular organisms.

Evolutionary Ethics

Natural law theory is based on an expansive interpretation of the lessons of biology at the level of behavior. Expansive interpretations of biology on the scale of evolution have not been lacking. Although philosophers and biologists generally regard the attribution of purpose to the universe as absurd, most laypeople regard evolution as a teleological process of ever-greater refinement and improvement, by which organisms got closer and closer to the ideal represented by the human species (or what the human species is *destined* to become). A few serious thinkers have also adopted this view and attempted to extract from the idea of evolution itself some sort of suggestive pattern that we could then use as a guide to life. Some, like the Jesuit

paleontologist Teilhard de Chardin (1961), have regarded the process of evolution as implementing a long-term design tending to ever greater complexity, destined to achieve ultimate perfection in an “omega point” featuring some sort of higher collective consciousness. Surprisingly, some, more recent thinkers have construed this as a prophetic foreshadowing of the Internet (Kreisberg 1995). Biologist Julian Huxley wrote an introduction to Teilhard de Chardin’s book endorsing the general idea that evolution is bound to yield ever-greater complexity. (T. H. Huxley, “Darwin’s bulldog,” was more tough minded than his grandson Julian. He maintained that “the ethical progress of society depends, not on imitating the cosmic process, still less in running away from it, but in combating it” [Huxley and Huxley 1947].) Again, some have speculated that optimal body plans and human-like intelligence were destined to result from natural selection (Conway Morris 2003).

It is true that a random walk that begins at the lowest possible degree of complexity has only one direction in which to move – namely, away from the wall of zero complexity. But some have worried that the human genome has reached a stage where any further increase in complexity would incur “mutational meltdown”: barring an increase in the already remarkable fidelity of DNA copying, disruptive mutations would claw back any further increase in complexity (Ridley 2000). There are also reasons to think that an unlimited increase in complexity may eventually issue in a formless chaos of maximum entropy; with all interesting patterns that include those that implement living things lying somewhere between the stillness equivalent to absolute zero and the “edge of chaos” (Langton 1992). Nevertheless, a number of people have quite recently continued to try to make good on the promise of grounding ethics in evolutionary theory in one way or another. This is attested by the contributions to a volume on the subject edited by Paul Thompson (1995). Thompson himself has proposed that we can define “evil” in evolutionary terms. According to Thomson, we can give the word a biological sense:

Evil ... is the attempt to enhance one’s own individual fitness at the expense of the short- or long-term perpetuation of the population to which the individual belongs. That expense ultimately reduces one’s own fitness since population collapse thwarts the perpetuation of that individual’s lineage along with everyone else ... A framework of behaviors that is

evolutionarily stable constitutes a viable, implicit social contract. The basis for this social contract arises from the essential feature of neo-Darwinian fitness – a propensity for self-preservation . . . In cognitive agents this – in part – manifests itself as rational self-interest. The term “evil” simply designates behaviors that break the rules of the social contract, that is, that work against the maintenance of an evolutionary stable system . . . behavior . . . that, were it generalized, would reduce the long-term fitness of all members of the group (even the perpetrator of the evil). (Thompson 2002, p. 246)

It might be complained that his definition doesn't completely capture what the word means in ordinary language. But a good precedent exists for giving a common term a slight technical twist: the biological treatment of the word “altruism” is compatible with egoism in the common psychological sense (Sober and Wilson 1998). The fatal objections to Thompson's proposal are of a different sort.

Both pro-social behavior and long-term fitness – in the guise of individual human beings' interest in having progeny – are conveniently things that we generally tend to approve of. But both are, for interestingly different reasons, contestable.

First, while it is certain that we have innate dispositions compatible with the development of psychological altruism, our dispositions to antisocial behavior are no less natural. What commends pro-social behavior is not the fact that it has been favored by natural selection. Rather, it is the very fact that it is pro-social. A preference for nice people over nasty ones has no need of support from evolutionary theory. To suppose otherwise is to violate a sound methodological principle that enjoins us to avoid wheeling in dubious propositions such as “Evolution favors pro-social behavior” in support of perfectly obvious ones like “Nice is better than nasty.”

As for the desirability of progeny, the fact that most people find it obvious does not insulate it from the charge of question begging. David Benatar, for one, has argued that having progeny is always immoral, on the grounds that never being born at all is better absolutely than even what we would, when alive, regard as a good life (Benatar 2006).

The verdict on evolutionary ethics, in short, is that its various versions are all unconvincing. Neither the frequency of a given behavior nor the detection of any trend or pattern in evolution would be sufficient reason to think it good. On the contrary, as T. H. Huxley suggested, we might have reason to “combat the cosmic process,”

however quixotically, in the name of some more important value. But where would such more important values come from, if not from our nature as humans?

The Multiplication of Possibilities

To answer the question in earnest, we should look beyond the limited range that has occupied me so far – the question of what might be inferred from natural facts about what it is to be human – and focus on the *possibilities* that are afforded us by the one capacity we do not share with other animals. I refer, of course, to our capacity for speech, which provides us with a virtually unlimited potential for generating new values. Once one goes beyond the minimalist view that is content with identifying impossibilities, one can begin to make distinctions between different kinds of possibility.

In the abstract, it may seem as if kinds of possibility are related like Russian dolls, of which each is contained by the last and contains the next. What is logically possible is compatible with the laws of logic. What is mathematically possible is logically possible but constrained by the laws of mathematics. The physically possible is constrained by all those but also by the laws of physics. Chemical possibility further constrains what is logically, mathematically, and physically possible. And, *prima facie*, we might think that biological possibility similarly constrains chemical possibility.

Unfortunately, the neatness is only apparent. There may not be such a thing as a biological law. Suggested examples, such as the Hardy-Weinberg law and Mendel's laws of inheritance, are either mathematical principles that happen to be applicable to some biological phenomena, or they are just not true. Or both. Biological possibility, I want to suggest, is constrained not by a further set of laws but by specific circumstances of the sort exemplified in Szathmáry and Maynard Smith's "major transitions" of evolution (Maynard Smith and Szathmáry 1999).

Examples of major transitions include the "invention" of prokaryotic and, later, of eukaryotic cells. Another key transition is from asexual to sexual reproduction. Here the reliability and stability of cloning is traded for a risky but potentially much more diverse exploration of radically new forms because sexual reproduction is really not "*re*-production" at all but radically new production in which every

individual is novel. Again, with the coming together of unicellular organisms into cooperative systems, first in homogeneous temporary bodies such as cellular slime mold and then into stable metazoans, individual cells lose their autonomy, becoming confined to specific roles. They must submit to the drastic process of apoptosis for the sake of the collective organism. In exchange for the loss of cellular autonomy, the resulting organisms acquire a rich new range of possible forms, behaviors, and potential niches. Later still, something similar happened when individual organisms formed societies, whether on the model of eusocial insects or that of hypersocial humans.

Several of these transitions involve a tradeoff between novel constraints and an enlargement of the range of concrete possibilities. In the latest of Maynard Smith and Szathmáry's key transitions, from elementary signaling to language, the new possibilities come not so much with new constraints as with new dangers. Language exposes one to manipulation and triggers an arms race between deception and detection. But what is most remarkable is the explosion of possibilities that it affords. Through discussion, debate, and inference, language makes possible the creation and transformation of values. In this process of proliferation, some values come in conflict with nature's basic imperative of replication, such as when an individual sacrifices herself and her chance of progeny for the sake of some idea. The whole process has a good claim to be regarded as the specific human differentia, which the existence of language merely enables.

The proliferation of values, which relies essentially on our capacity to talk, to debate, to make correct or fallacious inferences, involves a process that leads us to respond emotionally to new possibilities. Our beliefs, our desires, and the very nature of our interpersonal relationships are no longer simply determined by the emotional predispositions that we have inherited from our mammalian ancestors. We transcend biology, but as Daniel Dennett has pointed out, "This fact does make us different, but it is itself a biological fact" (Dennett 2006, p. 4).

In short, we might conclude that the main philosophical implication of biology is that we should be existentialists. Insofar as it is a biological fact that we have crossed that threshold beyond which we are faced with an indefinitely large set of possibilities, there is a sense in which our existence precedes our essence both as a species and as individuals.

Why Natural Selection Is Not Providence

While it may indeed be a biological fact that we transcend biology, this doesn't mean that we are not subject to deplorable atavisms. Many of our emotional dispositions prepare us in often astonishingly subtle ways to respond efficiently to life's challenges; at the same time, however, they can constrain and hamper our choices. The more optimistic perspective tends to dominate in the popular mind, where evolution is often credited with having assumed the role of Providence. Although sadly negligent in some particulars, Providence was nevertheless trusted to have done most things for the best, and both science and philosophy have flirted with that Panglossian perspective. While emotions used to be regarded as inimical to reason, much interdisciplinary work now stresses their functionality. The rehabilitation of shame, for example, is well under way (Deonna, Rodogno, and Teroni 2011), and even what looks to be an unequivocally nasty emotion, spite – the desire to harm another at high cost to oneself – has recently been commended for having an important part to play in the evolution of fairness (Forber and Smead 2014). Spite is also closely related to altruistic punishment: a willingness to incur some cost on behalf of a social group in order to punish an offense against the group, even if the offense has not directly affected the punisher (Boyd and Richerson 2005). These are just different aspects of the much-studied disposition to altruism, the exact explanation of which is still highly controversial (Nowak, Tarnita, and Wilson 2010; Wilson 2015). Whatever emerges as the resolution of these controversies, they illustrate a number of ways in which the workings of natural selection, particularly on our emotions, result in dispositions that we might have reason to deplore – and which undermine Aristotelian optimism. Here are three more examples.

McDonald's Emotions. McDonald's food is relished on first acquaintance by any child, from any culture, who might otherwise resist unfamiliar foods. Clearly, it is the food God or Nature intended for humans. The cravings that it satisfies originate in its provision of four nutrients that natural selection programmed us to seek when they were scarce: fat, sugar, salt, and protein. Our native emotional equipment has much the same problem: some of it, including perhaps dispositions to rape and violence, probably spread genes for their own

perpetuation. (It has been claimed that one man in 200 is descended from Genghis Khan.²) What was once adaptive may not be valued under now changed conditions.

Individuals Are Expendable. More generally, we have no reason to believe that evolution has any “interest,” however metaphorically understood, in individual organisms, including humans. Individuals are just one way that replicators use to replicate, and the type of sexually reproducing individuals we are constitutes only a very small proportion of the biosphere (de Sousa 2005; Clarke 2012). Whatever we might think about the relative importance of genetic, epigenetic, or extragenetic inheritance, individuals are never, as such, beneficiaries of natural selection. They are expendable. If evolution is based on the survival of the fittest, those fittest can’t be individuals, for no individual survives. What survives is information, carried by whatever replicators there turn out to be. Given that one of the values that we have instituted, in recent liberal Western societies, is the supposedly priceless value of the individual, the system of values that we claim to live by provides us with a strong reason not to take evolution’s choice of beneficiaries too seriously as a guide to what we should regard as important.

Frequency-Dependent Fitness. A third reason to mistrust the gifts of natural selection that can be illustrated in terms of a further problem for Paul Thompson’s proposal about biological evil. As we saw earlier, Thompson appealed to evolution’s supposed fostering of what was good for society. The implicit assumption was that if a trait is, from some applicable point of view, a “good thing,” then natural selection will bring it to fixation; if it is a “bad thing,” it will eventually be purged from the population. For many, if not most, traits, however, the fitness of the trait or gene depends in part on its frequency. When fitness is *frequency dependent*, alternative traits are in equilibrium, in the manner memorably modeled by Maynard Smith’s fable of hawks and doves. When hawks dominate, doves have the advantage; when doves dominate, hawks have the advantage (Maynard Smith 1984). This sort of equilibrium is known to be at the root of the rather wasteful proportion of males to females in sexually reproducing populations. It may be the sort of equilibrium that also sustains the existence of psychopaths

² See <http://blogs.discovermagazine.com/gnxp/2010/08/1-in-200-men-direct-descendants-of-genghis-khan/>.

among us. Being a psychopath is probably a good strategy for an individual living among people capable of altruism and empathy. Conversely, in a society of psychopaths, mutants capable of empathy might well have an advantage similar to that of rare doves in a virtually all-hawk environment in Maynard Smith's thought experiment.

Global Reflective Equilibrium

The moral of these last reminders is that we cannot assume that what natural selection has made possible is also desirable. Conceptions of morality or, more broadly, of the best ways to live, whether they are modeled on what appears natural to humans or merely inspired by what is possible, will remain essentially contested. One point does emerge, however, from recent work on the biological origins of morality. That is that the responses that count for or against certain moral stances are emotional ones (Haidt and Bjorklund 2008). Because our emotions are far from forming any coherent unity, anyone who is committed to finding the best answers to questions about how to live is condemned to allow mutual confrontation among all the members of a chaotic set of emotions and dispositions. It seems highly unlikely that we can discover anything like a simple vectorial sum of all our emotional responses. This is bad news for anyone who aspires to find a rational justification for ethical principles, even in my loose sense of justification, in some set of natural facts. Yet there is no serious alternative to bringing into mutual confrontation our conflicting intuitions about general principles, specific cases, valuable activities, legitimate responses, and beneficial behavior. That process will not yield to scruples about the "naturalistic fallacy." The question is not whether any logically valid reasoning processes can carry you from a set of facts to one or more evaluative judgments. Rather, it is about our *emotional inclinations* to prize certain things and despise others in response to the contemplation of facts. This by no means excludes rational deliberation and logical reasoning. On the contrary: reasoning is essential to the process and itself subject to its own set of epistemic feelings, such as the despair and the feeling of recognition described in Plato's *Meno* or the "clarity and distinctness" promoted as criterial in the Cartesian project of grounding knowledge (de Sousa 2008).

In that perspective, Mill's assertion that "the sole evidence it is possible to produce that anything is desirable is that people do actually

desire it” (Mill 1991) looks entirely reasonable. We don’t need biologists to confirm the biological fact that we desire pleasure. Mill’s claim has been criticized for fallaciously exploiting an ambiguity in the suffix “-able” or “-ible” that indicates worthiness in “desirable” but signals mere possibility in “visible.” Semantically, the criticism is valid, but it is also beside the point. What counts is that we are strongly inclined to take desire as a reason for judging something to be desirable. If no inference is any *better* than that, then Mill’s inference seems to be reasonable, even though it is sanctioned neither by logic nor by semantics.

If this seems dissatisfying, we should recall Hume’s demonstration that inductive inference cannot be provided with any noncircular justification. Inductive inference is just what we do in virtue of the way our minds are constructed. Actually, the same holds for deductive inference: in a mode of reasoning that looks “flagrantly circular,” as Nelson Goodman pointed out, “[a] rule is amended if it yields an inference we are unwilling to accept. An inference is rejected if it violates a rule we are unwilling to amend” (Goodman 1983, p. 64). This is essentially similar to the quest for “reflective equilibrium” recommended by John Rawls (1977) as the test for ethical practice and principle. In the absence of a consensus on foundations, nothing else is going to be either required or possible in ethical reasoning than the pragmatic endorsement of reflective equilibrium. The lineage of this idea goes back, before Goodman and Rawls, to Nietzsche and Hume. Rawls’s appeal to reflective equilibrium is of a piece with Goodman’s characterization of the predicates we commonly use as “entrenched” in existing projective practice; in turn, it reflects Nietzsche’s (1967) contention that instead of vainly attempting to justify ethics, we should attend instead to its genealogy. It is also clearly in harmony with Hume’s reduction of our inductive knowledge of cause and effect to “custom and habit” (Hume 1975, sect. V, pt. 1).

Our search for a philosophical reflective equilibrium that takes account of biology must be grounded in our emotional responses not only to the facts of biology but also to the models these provide. These can be valuable even when they are merely metaphors. They may even derive from facts (or ways of thinking about facts) about species other than our own. Recently, for example, a movie about penguins was taken up as a model for human behavior by certain fundamentalist groups, who enthused that it “passionately affirms traditional norms

like monogamy, sacrifice and child rearing" (Miller 2005). Rather than inferring that the two species exemplify two very different types of sociality, this approach bizarrely derives norms for humans from facts about a species with which we have no common ancestor for millions of years. As it happens, the penguin example was (like many of the "facts" that Aquinas thought to notice in nature) an invention bearing little relation to reality.

For an example to which one might feel more sympathetic, consider the idea of *individuality*. As mammals, people, unlike some other forms of life, are individuals in a sense that can be made quite specific and differs from the mode of life of other life forms, including most plants but also some parthenogenetically reproducing metazoans. In addition to being unique at the genetic level (with the exception of monozygotic twins), the sort of individuals we are enjoy an extraordinarily large potential for becoming even more different from one another in the course of development and learning. This is a fact of biology, but our attitude to it and what we make of it are obviously not determined by that fact. One might, for example, insist that in order to compensate for that unfortunate diversity, we need a strong dictatorial power that will bend us all to the same mold. But we may also be inspired to think that we *should*, in some nonmoralistic sense of "should," take advantage of the opportunity this affords us to make of ourselves, in a phrase once used by the French writer André Gide, "Ah, the most irreplaceable of beings" (Gide 1942, p. 186).

With individuality, we can reflect, comes diversity. Diversity in forms of life is attractive from both an ecological and an individual perspective. On the one hand, when plant species disappear, we may lose potential cures for diseases yet unheard of. But, on the other hand, we also value diversity for its own sake. The living world's astounding range of forms of life is awe inspiring. Analogously, the multiplicity of possible experiences appears as a gift bestowed on us by nature herself, which it would be churlish to reject.

Monogamy

If human diversity is deemed of intrinsic worth, why should diversity in relationships not seem equally desirable? And yet, in practice, we pigeonhole everyone and every relationship into one or two of a small number of categories: straight, gay, or bi and single, married, engaged,

or “just friends.” Why should this be? I conclude with some very brief remarks on this somewhat controversial question, intended to illustrate how we might actually take seriously certain findings of biology about possibility. A reasonable application of the strategy of reflective equilibrium, I want to suggest, might lead us to a fresh conception of often unquestioned assumptions about the role of the erotic in our lives.

The dominant ideology governing our normative conceptions of love, sex, and marriage is grounded in the ideal of monogamy and guarded by the social endorsement of the emotional sanction of jealousy. In Western society, the ideal of sexually exclusive monogamy, though honored more in the breach than the observance, is recognized officially in the institution of marriage and unofficially in the hypocrisy of shocked responses to celebrity scandals. The characterization of human beings as by nature a monogamous or “mildly polygynous species” (Barash and Lipton 2001, p. 41) is frequently brought out to explain or excuse a sexual double standard and is conveniently supported by a standard story told by evolutionary psychologists. That story starts from the discrepancy in gamete size between males and females and by a suspiciously swift chain of inference deduces that men and women should differ in many ways, supposedly traceable to different strategies of reproduction, resembling r-reproducing and k-reproducing species, respectively. Sexual jealousy should be more intense in men because of their uncertainty about paternity; women, however, are supposed to be more likely to experience emotional jealousy on account of their need for continuing support in the upbringing of offspring. Unfortunately for the standard story, that difference, although it seemed borne out in the United States (Buss 1994), tends to vanish altogether in countries with more gender equality (Harris 2004). Much the same is true for other alleged sex differences: on further examination, most turn out to be effects of the very stereotypes that they supposedly justify (Tavris 1992; Fine 2011). If anything, it now seems likely that the biological facts about female sexuality are closer to the traditional view of women as sexually insatiable than the nineteenth-century view, still prevalent in some circles, of coy females requiring to lie back and think of the Empire in order to serve the needs of procreation (Baker and Bellis 1995; Ryan and Jethá 2010).

Helen Fisher (1998, 2004) has shown that what we call love tends to conflate three very different syndromes, each of which has its own characteristic phenomenology, neurochemical correlates, and

duration. These three are lust, obsessive romantic love or “limerence” (Tennov 1979), and long-term attachment. By conflating these, the monogamist ideology comes very close to requiring what even a minimalist biological perspective might judge to be simply impossible. George Bernard Shaw put it thus:

When two people are under the influence of the most violent, most insane, most delusive, and most transient of passions, they are required to swear that they will remain in that excited, abnormal, and exhausting condition continuously until death do them part. (Shaw 1986, pp. 34–5)

Multi-million-dollar industries of couple counseling, prostitution, and pornography bear witness to the fact that the resulting norms are unenforceable and exact a severe toll from individuals attempting to conform to them. Among the multifarious possibilities brought on by the human capacity for language, one might therefore infer that an alternative ideology might be more likely to fulfill a modestly expansive view of how nature might best be recruited to promote thriving relationships. For those who might still see this as “incompatible with human nature,” proofs of possibility can be found both in anthropology and in experiments conducted by minority explorers in ordinary liberal society. Anthropology affords examples of societies, such as the Mosuo, where marriage is unknown. Mosuo women choose their lovers as they please, and men’s interest in their progeny is dealt with not by jealous sequestering of the mothers of their children but by raising their sisters’ offspring (Yang and Mathieu 2007). Increasingly visible polyamorous communities bear witness to the fact that to recognize the factual separability of attachment and sexual attraction enables many people to reject the bizarre conception of loyalty or “fidelity” in terms of sexual exclusion (Easton and Hardy 2009).

It will not be easy to adjust social norms, even in the light of the undeniable fact of diversity in individual temperaments and preferences. But the considerations just alluded to suggest that different ideologies of sex and love are possible. Racism, slavery, sexism, and the fanatical opposition to gay marriage offer instructive precedents. All were supported by an abundance of allegedly scientific evidence about “human nature,” now plainly seen to be worthless (Gould 1981). In only a couple of hundred years – or a surprisingly short fifty in the case of gay marriage – the stronger arguments have won out with the majority of the society as a whole. Perhaps a similar

regestalt might, in another fifty years, result in the current normative ideal of sexually exclusive monogamy being seen as resting on objectively false dogmas about human nature. The ideology of monogamism, just like racism, slavery, sexism, and heterosexism, might then come to seem almost unintelligible.

That would be one way of implementing the deepest philosophical lesson of biology. That lesson, which should come as an ironic rebuke to the army of fulminating biophobes who think they are defending humanism by attacking a supposed “biological determinism,” is that we should all be existentialists.

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