become derivable. By choosing the language for such addition to be *operator-free,* we isolate *E* altogether. So, the deviancy of *E* is definitely a local matter.

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Foot note

TIM LEWENS

1. Foot on natural goodness

Philippa Foot has long held that ethical judgements can be understood as factual judgements about functional performance (Foot 1961). She has clarified and expanded on these views considerably in her book *Natural Goodness*. She describes her project thus: 'I want to show moral evil as "a kind of natural defect"' (Foot 2001: 5).

For Foot, moral evaluation of human action is the same in kind as the evaluation of animal and plant physiology. When we judge that some structure or process is defective, we judge it to be so with respect to functional norms for the species in question. It does not matter if we are evaluating the practical deliberations of a human, or the wings of a bird: in both cases, we make straightforward factual claims.

Some quick words of clarification are in order. Foot does not say that functional defects in animal or plant structures are *moral* failings. A tree's roots cannot be evil. On Foot's view, ethical evaluation applies specifically to defective practical reason – not to other defective organs or processes. But an evil person is one whose practical reason is defective, and this faculty is defective in just the same sense that a wobbly oak tree's roots are defective.

Analysis Vol 70 | Number 3 | July 2010 | pp. 468–473 doi:10.1093/analys/anq036

Foot's aim, then, is to provide a naturalized account of ethics by means of a naturalized theory of functions. Foot describes her account of functions as Aristotelian. On Foot's view, functional specifications consist in a list of 'Aristotelian necessities' – those behaviours or traits that are necessary for the good of each 'species' or 'life-form'. Any token organism can then be judged as defective if it fails to match the functional specification for its species.

2. *A biological objection to Foot*

Those working in the philosophy of biology may have worries about Foot's account of species, and also about her account of biological functions. Here I focus on just one objection, which I choose because it has general force against any attempt to link moral good or evil to a naturalized account of functional performance.

For Foot, once again, function claims concern what she calls 'Aristotelian necessity . . . that which is necessary because and in so far as good hangs on it' (2001: 15). She gives some examples of Aristotelian necessities:

> We invoke [this] idea when we say that it is necessary for plants to have water, and for lionesses to teach their cubs to kill. (2001: 15)

In the case of plants and non-human animals, the species' good is fairly tightly circumscribed:

> The way an individual should be is determined by what is needed for development, self-maintenance, and reproduction: in most species involving defence, and in some the rearing of young. (2001: 33)

Foot's general case draws on an apparent affinity between normative notions of an organism's 'flourishing', and biological notions of good functioning. This link, although seductive, is misleading. The alleged link is foreshadowed in Foot's much earlier work. Writing of an oak tree's roots, she says that:

> Because the root plays a part in the life of the organism we can say it 'has a function', relating what it does to the welfare of the plant. (1961: 59)

This already introduces a conception of biological function as that which contributes to the *welfare* – and not the *fitness*, note – of an organism.

We can illustrate some of the problems that face Foot's view by considering the fact that for individual organisms, there can be trade-offs between self-maintenance and reproduction. Suppose we ask how a given organism should be. Should it live for a long time, thereby using resources that would have enabled it to have more offspring? Or should it have a small number of

healthy offspring, and then die shortly afterwards, leaving resources to future generations? What determines whether reproduction or self-maintenance is the more important element of flourishing? Foot seems committed to the claim that natural facts alone can decide the issue.

The evolutionary biologist might say that the optimal phenotype is that which most effectively promotes long-run fitness. But it is implausible to think that what is optimal in the evolutionary biologist's sense corresponds with what promotes the flourishing of individuals. Consider a species in which the members with the greatest reproductive output die earlier than they need to, but have more offspring in virtue of this. Other members of the species live considerably longer, but they have somewhat fewer offspring. It is implausible to think that these latter members fail to flourish simply because their reproductive output is lower than that of fitter conspecifics. True enough, some evolutionary biologists might say that they 'malfunction' in virtue of this fitness gap. Here one effectively stipulates that good functioning is to be equated with some notion of biological adaptation. But from the perspective of individual health and flourishing, these longer lived individuals might be judged better off than those that die early. It is not clear that any naturalized theory of function can tell us, in the face of trade-offs such as these, where flourishing lies. There is a gap between the sort of normative notion of flourishing that Foot seeks to capture, and theories of good biological functioning based on reproductive output.

3. *Potential responses*

In this penultimate section I briefly consider two responses Foot might make.

(1) The human good is more complex than the good of plant or animal species.

Foot might remind us of some of the complexities of her view. For plants and many non-human animals, the species' good is determined by self-maintenance and reproductive output. For humans, things are more complicated. Foot says, for example, that 'The goods that hang on human cooperation ... are much more diverse, and much harder to delineate than are animal goods' (2001: 16). She might then try to argue that once these more complex elements of human good are factored in, the sorts of trade-offs I have laid out above can be resolved.

The primary problem with this response is that Foot's account is meant to establish that moral evaluation in the human case consists in a complexification of a fundamentally similar form of evaluation that we can bring to plants and animals. Even if the case for humans has many more dimensions than plant cases, it is important for Foot that her account should begin by making sense of the relatively simple evaluations we use when assessing parts of plants. But the problem raised by the case of trade-offs between

self-maintenance and reproduction is that even in the simple cases of plants and animals, it seems that evaluations based on theories of biological functioning do not deliver plausible verdicts with respect to normative notions of the flourishing of a plant or animal.

There is a secondary problem. Foot tells us that there are more elements to the human good than reproduction and self-maintenance. She says, for example, that friendship is an element of the human good. But it is unclear what allows her to generate these aspects of the good. Aristotelian necessities, remember, concern 'that which is necessary because and in so far as good hangs on it'. A tree whose roots do not allow it to stand upright is faulty, in virtue of the fact that strong roots are necessary for the tree's good, which is constituted by its self-maintenance and reproduction. Even if one grants that we can make sense of characteristics that are necessary for the species' good once that good is fixed, Foot says rather little about what makes it the case that something is an element or aspect of the good itself. This becomes an especially pressing issue once one wishes to claim that the good for humans is not exhausted by apparently 'biological' qualities such as reproduction and self-maintenance. Foot's general project here is to show that 'the norms we have been talking about so far have been explained in terms of facts about things belonging to the natural world' (2001: 36–37). But a residual worry remains regarding the factual status of aspects of the good.

(2) Foot's account of function should not be confused with the technical biological notion of function.

In an important note, Foot asserts that:

> It is imperative that the word 'function' as used here is not confused with its use in evolutionary biology ... It is easy to confuse these technical uses of words such as 'function' and 'good' with their everyday uses, but the meanings are distinct. (2001: 32)

Perhaps the biological example of trade-off that I discussed above only raises problems in the context of a technical definition of biological function, which equates function with contribution to fitness, or some such. More specifically, Foot might remind us that her Aristotelian theory says that what underpins how species' members ought to be is not that which *contributes*, or has contributed, to development, self-maintenance and reproduction, but rather that which is *necessary* for these things. Presumably, there are some activities that contribute to these ends, but members of the species would get by perfectly adequately without the activities in question. In the context of the example we have been discussing, Foot might observe that even if dying early contributes positively to reproductive output, it is presumably not necessary for reproduction. Hence, we needn't say that a longer lived species member is defective, for that species member might not fail in any activity that is necessary for the species' good.

This response raises far more problems than it solves. Given that evolutionary considerations suggest that adaptation occurs when one trait offers a fitness advantage over another, there will typically be times when the favoured trait is not necessary, but is nonetheless beneficial. So if we really insist on the strong claim that functions are only given to traits that are necessary, our account will be extensionally inadequate. Foot's account suggests that something as strong as this is what she has in mind:

> We are, let us suppose, evaluating the roots of a particular oak tree, saying perhaps that it has good roots because they are as sturdy and deep as an oak's roots should be. Had its roots been spindly and all near the surface they would have been bad roots; but as it is they are good. Oak trees need to stay upright because, unlike creeping plants, they have no possibility of life on the ground, and they are tall heavy trees. Therefore oaks need to have deep sturdy roots: there is something wrong with them if they do not, and this is how the normative proposition can be derived. The good of the oak is its individual and reproductive life cycle, and what is necessary for this is an Aristotelian necessity in its case. Since it cannot bend like a reed in the wind, an oak that is as an oak should be is one that has deep and sturdy roots. (2001: 46)

Oaks need strong roots, because strong roots are the only possible way for them to stay upright. One might quibble with Foot's notion of modality here: we can obviously imagine oaks that stay upright without strong roots, and some oaks keep erect simply by leaning against other trees. But more to the point, peacocks do not *need* gaudy tails in order to survive and reproduce; it is simply that without them their chances of gaining a mate are greatly reduced. Yet surely Foot would want to say that a peacock with a drab tail is defective.

4. *Conclusion*

We make what appear to be perfectly factual judgements about defective traits in plants and animals all the time. What is more, these judgements appear to make implicit reference to some standard of flourishing; what we might think of as the nature of the species. The argument presented in this article assumes that the onus is on Foot to explain to us what sorts of things species' natures are, what sorts of facts might make them one way rather than another, how we might decide between two competing judgements about the nature of a given species and so forth. A biological account of functioning based on fitness seems wholly inappropriate to serve as a basis for claims about flourishing, and Foot's own Aristotelian account is also inadequate. So while it is true to say that we make many confident claims

about organic flourishing, we have yet to be given reasons for thinking that these judgements are of a factual nature. This is not the place to explore the proper understanding of such judgements in detail, but it is worth noting the attractions of a simple error theory. On this view, we mistakenly believe species to have natures of the kind that enable us to make judgements of the form Foot has alerted us to. We might go on to argue that the failure to reduce statements of these kinds to those of a more respectable biological variety does not show the existence of non-natural facts about species' natures, nor does it point us in the direction of an Aristotelian account of function. It shows, simply, that we are mistaken about the nature of the natural world. I have not argued in detail for such an error theory here, but I suggest that the problems faced by any account of the alleged facticity of claims about species' flourishing and species' natures boost the plausibility of such accounts considerably.[1]

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1 An earlier version of this article was presented at a meeting on 'La notion de fonction: des sciences de la vie à la technologie' at the Collège de France, Paris, in May 2008. I am grateful to the audience there for comments, and to Hallvard Lillehammer for discussion. Funding: This work was supported by the Leverhulme Trust and the Isaac Newton Trust.

Monty Hall drives a wedge between Judy Benjamin and the Sleeping Beauty: a reply to Bovens

Luc Bovens and José Luis Ferreira

Bovens (2010) points out that there is a structural analogy between the Judy Benjamin problem (JB) and the Sleeping Beauty problem (SB). On grounds of this structural analogy, he argues that both should receive the same solution, viz. the posterior probability of the eastern region of the matrix in Table 1

Analysis Vol 70 | Number 3 | July 2010 | pp. 473–481 doi:10.1093/analys/anq020