



The good of non-sentient entities: Organisms, artifacts, and synthetic biology[☆]



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ABSTRACT

Synthetic organisms are at the same time organisms and artifacts. In this paper we aim to determine whether such entities have a good of their own, and so are candidates for being directly morally considerable. We argue that the good of non-sentient organisms is grounded in an etiological account of teleology, on which non-sentient organisms can come to be teleologically organized on the basis of their natural selection etiology. After defending this account of teleology, we argue that there are no grounds for excluding synthetic organisms from having a good also grounded in their teleological organization. However, this comes at a cost; traditional artifacts will also be seen as having a good of their own. We defend this as the best solution to the puzzle about what to say about the good of synthetic organisms.

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1. Introduction

Synthetic organisms are thoroughly engineered organisms. Synthetic biology makes use of genetic and other materials derived from modern biological life forms to design and construct organisms.¹ Among recent, high-profile events in the field are the genomic (or chromosomal) reconstruction of a *Mycoplasma* bacterium and its transfer to a host bacteria cytoplasm to run the cell (Gibson et al., 2008, 2010; Lartigue et al., 2009), as well as the engineering of bacteria to produce the precursor to artemisinin, an effective but relatively scarce anti-malarial drug traditionally derived from wormwood plants (Ro et al., 2006). Other synthetic organisms (perhaps, more properly called artificial organisms), are not constructed from parts of existing biological organisms, but from non-biological or pre-biological materials. Researchers at Los Alamos Laboratory have reported creating “self-replicating cells assembled from nonliv-

ing organic and inorganic matter (AAAS, 2010),” and a research team at Harvard Medical School has constructed proto-cells from fatty molecules using nucleic acids as the source code for replication (Sztostak Lab, n.d.; Mansy et al., 2008). The vision for both research programs is to “engineer living-technologies, which will be robust, autonomous, adaptive, and even self-replicating (AAAS, 2010).”

Synthetic organisms are at the same time organisms and artifacts. In this paper we aim to determine whether such entities have a good of their own, and so are candidates for being directly morally considerable.² On the one hand, non-engineered biological organisms such as plants and bacteria can be benefited and harmed in straightforward ways. Pouring acid on a plant or a bacterium harms it, providing nutrients and access to sunlight benefits it. These benefits and harms are benefits and harms to the individual plant or bacterium, independent of the aims and interests of others. This is just to say that they have a good of their own, and we must ask whether and

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¹ There are a number of definitions of synthetic biology. Here are two that are representative: Synthetic biology is “1. The design and construction of biological parts, devices and systems, and; 2. the redesign of existing, natural biological systems for useful purposes (Synthetic Biology Group, 2009).” “Synthetic biology is a new research field that seeks to modify existing organisms to perform useful functions and to design and synthesize artificial genes and complete biological systems (COGEM, 2008).”

² Following Goodpaster (1978), we are using the term ‘moral considerability’ in a technical sense to pick out a particular species of moral status. It is the moral status an entity has when it (a) has interests and (b) those interests are morally relevant (i.e., should be taken into account in moral deliberations).

how to take their good into account in ethical deliberations—i.e., whether they are directly morally considerable. On the other hand, traditional artifacts are not typically thought of as the types of entities that can be benefited or harmed in and of themselves. While it is bad for a laptop to fall to the ground, this is, it is typically thought, because it constitutes a bad for its owner, not because it is a harm to the laptop itself. Therefore, while we typically take organisms to belong to the category of things that can be benefited or harmed, we typically think that artifacts do not belong in this category; artifacts do not appear to have a good of their own, and therefore do not appear to be candidates for direct moral considerability.

So, what are we to make of synthetic organisms? Do they share the features of traditional organisms in virtue of which they have a good of their own? Or, are they like artifacts in the relevant respects and thereby lack such a good? Or, will consideration of synthetic organisms force us to question the standard way we understand organisms and artifacts? We approach this question by identifying what grounds the good of traditional, non-sentient organisms, and then determining whether these grounds obtain as well for synthetic organisms.

The best account of the good of non-sentient organisms is that such organisms are teleologically organized, goal-directed systems. Insofar as this goal-directedness can be explicated in ways that are independent of the interests of others, these entities will have a good of their own. We defend an etiological account of teleology on which non-sentient entities have such a good. On this account, the goal-directedness of an (non-sentient) entity is given by the selection process from which it results. Furthermore, the content of this good can be given in terms of what will promote or frustrate the achievement of its goals.

If teleological organization is sufficient for having a good of one's own (what we will call the *sufficiency thesis*), synthetic organisms will also have a good of their own, since they are so organized. However, there is a complication with this line of argument. Most artifacts—not just those that are also organisms—are also teleologically organized.³ For example, thermostats are organized toward accomplishing an end, regulating the temperature of a space. Thus, this approach to grounding the good of an entity appears to have the counter-intuitive implication that (nearly) all artifacts have a good of their own. There are three possible ways to respond to this implication. One might reject the etiological account of teleology; reject that teleological organization is sufficient for an entity having a good of its own (i.e. reject the sufficiency thesis); or accept the conclusion that artifacts have good of their own. We argue that the last of these—accepting that artifacts have a good of their own—is the best justified option.

2. Non-sentient organisms

We claimed above that naturally occurring, non-sentient living things (from here on, *non-sentient organisms*) have a good of their

own.⁴ What we mean by this is that they can be benefited or harmed, and that this benefit and harm can be understood without reference to the good of any other entity. In claiming this, we are asserting that these entities have interests. It is in the interest of a sugar maple to get sunlight and not be exposed to acid rain, for example. These things are in its interest even if nothing cares about the tree, is benefited by it, or even knows about it. In this section, we explicate this claim and defend it by providing an account of the interests of non-sentient living things on which their interests are neither arbitrary nor reducible to the interests of others.

Before continuing, it is worth noting that we do not intend “having a good of one's own” or “having an interest” in a morally loaded way. That is, we leave it open whether some being's having an interest requires agents to take that being's interests into account in moral deliberations. Thus, while we think that that in order for an organism to have interests, there must be some way to ground that good that is not purely descriptive, we do not think they are normative in the sense that they ground any moral requirements.

2.1. Having an interest vs taking an interest

That non-sentient organisms have interests is often contested. For example, Singer (1977, 1989) argues that sentience is a necessary condition for having interests. A non-sentient entity lacks the capacity, even in a minimal sense, to take an interest in or to be interested or disinterested in anything that happens to it.⁵ However, it is important to distinguish between the claim that ‘S has an interest in X’ and ‘S is interested in X.’ ‘S is interested in X’ requires cognitive capacities. To claim that S is interested in X is to claim that S has attitudes or desires regarding X, which requires being aware of X. We are not suggesting that non-sentient living things can have attitudes regarding anything. We are claiming that there are things that are in their interests (or good for them), that is that they have an interest in certain things despite not being interested in them. So while cognitive capacities are necessary for an entity to be interested in something, it doesn't follow from this that cognitive capacities are necessary for something to be in an entity's interests, or, in other words for a being to have an interest in something.⁶

Still, in order to make the case that non-sentient organisms have a good of their own, an account of what grounds their good needs to be provided. That is, there must be an explanation for why acid rain is bad for maples and sunlight is good for them. If there is no such explanation, then any assertions about what is good or bad for them are arbitrary. Moreover, since they lack cognitive capacities, the explanation cannot trace back to their caring or wanting (or otherwise taking an interest in) anything. It cannot be that acid rain is bad for maples because it defoliates them in late summer and maples do not like to lose their leaves before autumn. The account also cannot depend on the attitudes of others—e.g., that people like maples to hold their foliage late in the autumn.

³ Some artifacts, like piles of trash or the unused byproducts of some manufacturing processes, are not teleologically organized.

⁴ By “naturally occurring” we mean independent from human design, manipulation, and control. Naturalness so conceived comes in degrees. Deep sea organisms are more natural than suburban deer, which are more natural than genetically modified crops, for example. In referring to naturally occurring non-sentient organisms we mean to pick out almost all non-sentient organisms, but to exclude highly engineered organisms, such as non-sentient synthetic biological organisms.

⁵ According to Singer, and others, some kind of conscious, cognitive capacity is necessary for having an interest precisely because a thing cannot have any interests if it takes an interest in nothing. However, this is not to say that an entity need take an interest in any robust sense. On Singer's view, the capacity for feeling pleasure and pain is sufficient for an entity's being able to “take an interest” in something. That is, the requirement for taking an interest in, for example, an apple doesn't require an interest in apples as such (which would require a thing to have a particular concept, but only having something like a pro-attitude towards apples).

⁶ Taylor (1989) and Varner (1998) appeal to this distinction in their defense of the moral considerability of non-sentient organisms. Feinberg (1963) also recognizes that there is a sense in which plants may have interests, but he believes they are interests only in an attenuated sense. For him, as well as for Steinbock (2001) and Simmons (2010), having genuine interests would entail that those interests would be morally relevant. However, on our understanding of interests or goods, this does not follow immediately. It might turn out, say, if welfarism is true, that any defense of a being's having an interest entails that those interests are morally relevant. However, there is still a conceptual difference between having a good and having that good matter in moral deliberations (see O'Neill, 2003). Furthermore, one can see that, on some normative theories, the welfare of various beings might not matter. To use just one example, consider a sort of contractualism where the contractors only agree to norms that take the welfare of agents into account. This version of contractualism may suffer all sorts of problems (especially concerning so-called “marginal cases”), but it is a view on which there is a coherent distinction between having interests and having them matter. Since we can't hope to settle all the normative issues that would have to be settled to decide whether welfare is a sufficient condition for moral considerability, we leave it open.

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