NOTHING IS ALIVE (WE ONLY SAY SO)

Jiri Benovsky

Finding an adequate definition of 'life' has proven to be a tricky affair. In this article, I discuss the idea that nothing is really alive: we only say so. I shall argue that 'being alive' is not a genuine property of things, and that it only reflects the way we think and talk about things. An eliminativist strategy will then allow us to free ourselves from the burden of having to find a definition of life, and will allow us to focus on the genuinely interesting properties of living (and non-living) entities.

§1. The search for extraterrestrial life is complicated. Not only because of the logistics of travelling long distances, but also because it is far from being clear *what* one should be looking *for*. Think of James T. Kirk facing for the first time the Dikironium cloud creature[1] or the Beta XII-A entity.[2] Or think of Lieutenant Commander Data[3] arguing with Q[4] – two entities talking to each other, in a situation where it is far from being clear whether either of them is a living creature.

To encounter difficulties with borderlines cases of life, one does not have to (boldly) go so far from Earth. Protocell synthetic biologists aim at producing new life forms by creating artificial cells from scratch, bioengineers work by trying to introduce new metabolic pathways in already living cells, while silico-synthetic biologists work on computer simulations of synthetic organisms. In many ways humans thus set themselves the task to create new life, through rational design.[5] But when exactly does something start to count as 'life'? This question appears to be crucial not only when it comes to identifying something as being alive or not, but also when we try to determine the origin of life on Earth.

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To be alive, or not: that is the question. In this article I will question this question, and I will question the way in which it is often formulated. I will claim that there are a lot of interesting questions in the neighbourhood of this question, but *not* this one itself. First, we shall see that attempts at defining 'life' all raise problems and counter-examples; second, we will see that among the reasons for this failure to find a definition lies the vagueness of the words 'life' or 'is alive' and, most importantly, that we are facing here a *linguistic* (as opposed to metaphysical) phenomenon; and third, I will defend an eliminativist view of life. Thus, when encountering new types of entities, or when synthesizing them in labs, we should not so much ask ourselves whether they are alive or not, rather we should focus on (other) interesting properties they have.

§2. The most straightforward strategy, if one wants to decide whether an entity *x* is alive or not, is to produce a *definition* of life and check whether *x* satisfies the definition of not. The trouble is, it is hard to produce a non-arbitrary and good definition.

Aristotle (1961: 415^{a22}–415^{b2}) defines life as the capacity to reproduce, but fire can perhaps be said to possess this capacity, while not counting as a case of life. Cleland and Chyba (2007: 5.2.2) critically discuss the popular Darwinian – genetic – definition of life where life is defined as a system capable of undergoing Darwinian evolution. But, as they correctly argue, such a definition (i) does not allow for the possibility of primitive cellular life where reproduction without DNA replication would take place, thus precluding Darwinian evolution, and (ii) it has the unwelcome consequence that since individual organisms do not themselves evolve they do not count as cases of life, since the Darwinian definition is a claim about *systems* capable of undergoing evolution. Perhaps, one could add that beings such as God or Q cannot (did not?) reproduce at all, while – controversially, but possibly – being alive at least in the sense in which all conscious creatures are alive. Here are some often-cited examples of attempts at defining life:

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	Short definition	*Problem/objection*
Darwinian definition	Life is a system capable of undergoing Darwinian evolution.	(i) Does not allow for the possibility of primitive cellular life where reproduction without DNA replication would take place. (ii) Individual organisms do not themselves evolve, and thus do not count as cases of life.
Metabolic definition	Life is the capacity to reproduce, move and grow by converting energy.	Possible counter-examples (such as, fire).
Biochemical definition	Being alive is being based in a certain type of biomolecules.	Can in principle always face counterexamples of entities that would count as alive but that would be based in a different type of molecules.
Autopoiesis	Life is the capacity of self-production and self-maintenance.	Possible counter-examples (such as, some machines).
Communication definition	Life is the capacity to interact and communicate with one's environment.	Possible counter-examples (such as, some machines, or software).

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Every definition has its merits and brings its bit of interesting piece of information about some feature of life (at least, life as we know it on Earth), but any such feature does not seem to be a necessary one (and thus, it suffers from possible counter-examples), nor a sufficient one (and thus, the definition fails). This has been argued for at length by Sagan (1970), Cleland and Chyba (2007), Cleland (2012), and Deplazes-Zemp (2012: 758–9), who also addresses the case of a combination of several or all of these features into a single list-like definition.

The common idea of any such definition is to produce a tool to separate all entities into two mutually excluding categories: on the one side entities that are alive, and on the other side those that are not. But in addition to all the reasons for failure of these definitions (such as, the possible counter-examples and problems quickly mentioned above and nicely discussed in Cleland (2012: §2)), there is a general very simple reason why such a strategy is bound to fail in principle: the vagueness of 'life'. Indeed, there are things which are clearly alive, there are things which are clearly not alive, but there are (actual or possible) borderline cases and unclear cases, where a definition would seemingly help by categorizing them into one group or the other – but often, such help might simply be wrong in thinking that all entities nicely fit into these two categories, ignoring the vagueness involved here. *Any new borderline cases might actually always be reasons to reject the definition at hand and to revise it in the light of these new cases*.

I am not going to insist on the vagueness of 'life' or 'is alive'. But I do want to insist on the fact that what the vagueness involved here shows us is that the trouble does not come from the world (that is, a vague world, where it is hard to find a definition that would fit its vague nature), but from us (from our language). The issue is a purely linguistic one and should then be treated as such. There are three main theories addressing the problem of vagueness in general: the metaphysical approach, the epistemic

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approach, and the supervaluationist approach. But, the metaphysical approach fails,[6] the epistemic approach works well only under a linguistic interpretation,[7] and the supervaluationist approach also clearly emphasizes the linguistic nature of the problem.[8] Vagueness is a linguistic affair.

Thus, 'life' and 'is alive' are vague terms, and it does not seem very promising to think that we can a find a precise and non-arbitrary definition of them (Dupré and O'Malley (2009) defend a similar claim, for different reasons). Vagueness, in general as well as in the case of 'life', *comes from us and not from the world*. Now, this points (inconclusively but interestingly) towards the idea I wish to put forward here, namely that 'is alive' is merely a predicate that we use to talk about things. Being alive is allegedly a property of those things. But, importantly, being alive is not a property like, say, having positive charge or being round. Having positive charge or being round are properties we can find in the world; things are round or have positive charge independently of us and we can find out about them. Being alive is a different affair – it is not a genuine primary quality of things in the same way these other properties are. You can't put Data under a microscope, or measure him in any scientific way to find out whether he is alive or not. You can't look closely at him and say: 'Here it is! See there this property? He is alive!' You *can* do this, however, with many other of his properties: he can talk, he has such and such a shape, he can play the violin, he has a certain weight, and so on. (*En passant*, note that, relevantly, 'being conscious' is a very different affair from 'being alive'. If Data is a conscious being, then he does have the property of being conscious.)

Now, the important thing to realize is that when we list all those things we can learn about Data, we are then in a position where *we know all there is to know* about him – and the fact that he is alive or not is not on the list. As we have seen above, the vagueness of 'is alive' is a linguistic phenomenon, a fact about our use of the predicate, which fits well with the idea I want to convey here: not only does

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the vagueness of life come from us rather than from the world, but the very idea that some things are alive while others are not is a mere artefact of our thought and language; it is not a metaphysical fact – i.e. nothing in the world is, independently of us, alive or not. What there *is* in the world is a huge variety of entities with a lot of different genuine properties like the property of being able to crawl, the property of being able to reproduce, move and grow by converting energy, the property of being based in a certain type of biomolecules, the property of being able to interact and communicate with one's environment, and so on. *These* are the genuine and the interesting properties. Categorizing the entities that possess these properties into two separate categories (alive or not alive) is then no more than expressing our comparative interests for one or another of such properties or a set of such properties.

Cleland (2012) rightly argues that we are in no position to formulate a good definition of life or even a good scientific theory of life because we have at our disposal a very restricted sample of living things (those located on Earth and nearby). But would it really help to have a larger, even a much larger, sample? What we could get from a larger sample of entities is a larger sample of various properties such as the property of being able to reproduce, the property of being able to crawl, etc. But none of these properties would be the property of being alive.

What we see here is that asking for a definition of life is not really the interesting question to ask. Take Jean-Luc Picard, who may indeed be in doubt whether his friend Data is alive or not, since he is a borderline case featuring some of the properties often associated with living things but lacking others. What is the correct attitude Picard should adopt here? In the light of what precedes, I submit that he should focus on the things he *can* know about Data (say, that he is a good officer and a good friend), and simply dismiss the question of whether he is alive or not as a simple matter of an arbitrary decision one could take (but that one *does not have* to take). When knowing that Data

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can talk, crawl, play the violin, and so on, Picard knows all there is to know about him, and 'knowing' that he is alive would bring no additional relevant knowledge at all – indeed, it is even hard to imagine what such a knowledge would amount to.

Things are similar with, say, the protocell synthetic biologist who manages to create a new type of cell in the lab. The cell has then such-and-such new interesting properties, and perhaps it can behave in some ways which are similar to other cells we typically call 'alive' and perhaps it is dissimilar in other respects to these typical cases. Again, the scientist knows here all there is to know about the new cell, and claiming that it is alive would be at most the statement of a comparative interest she takes in some of its features.

The same thing is true about the search for extra-terrestrial life: it is not so much life that is interesting to look for, but other kinds of things. For instance, it would be interesting to find out whether in other parts of the universe there are entities based on biomolecules similar to ours, or whether there are entities that can reproduce, or whether there are entities that are intelligent and conscious, or whether there are entities that are capable of evolution and that undergo natural selection. *These* are the interesting questions, and here we *do* know what to look for. Forgetting about life, and focusing on genuine interesting properties of things is then not only conceptually more adequate but makes programmes to search for extra-terrestrial life a lot easier, since it can set tasks in a non-vague and clear way.

Some biologists and philosophers reject the whole idea of there being a need for a definition of 'life', since according to them it is an irreducible brute fact about the natural world. My suggestion is *also* to reject the need for a definition, but for the exactly opposite reason: there is no such genuine property in the world, and so any definition is a purely linguistic and mostly arbitrary affair (which does not prevent it from possibly having some useful practical

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purposes and applications, of course). Life, I submit, is better understood as *not* being a natural kind.

§3. The argumentative strategy used in the preceding section is this: we should not postulate the existence of something (an entity or a property) if we do not really need it. This eliminativist view about life then parallels (but does not entail nor require), a general eliminativism about ordinary macroscopic material objects. Such a more generalized view not only claims that we do not need to postulate the existence of a genuine property of being alive that would be a natural kind, but that we even do not need to postulate the existence of many other things like trees, tables, planets, cells, and so on. Various versions of such an eliminativist view can be found in Van Inwagen (1990),[9] Merricks (2001), and Sider (2013). The common idea to both eliminativist strategies (the restricted one about life and the general one about, say, tables) is that without having to postulate such entities or properties, we already have all we need to account for all phenomena that need to be accounted for: we do not need the property of being alive because we have all the interesting properties of cells, Data, and so on, and we do not need tables because, as the eliminativist puts it, we have atoms[10] *arranged tablewise*. As I am now typing this sentence on my computer, it seems to me that I see a table in my visual field. But, as Merricks (2001: 8–9) rightly claims, my visual experience would be exactly the same even if there were no table and if there were 'only' atoms arranged tablewise. Indeed, the visual experience I have is caused by light reflected by the atoms, and this reflection would be exactly the same if there were a table. The idea here is that our sensory experiences can be accounted for in terms of some more basic and genuinely fundamental (and existing) entities, and so there is no need to postulate a further entity (a table). In the case of allegedly living things, the analogous (but not exactly the same) claim is that our observations of, interactions with, and experiences of living things can all be accounted for in terms of the genuine properties they have

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(such as, being able to reproduce, being based on such-and-such biomolecules, being able to crawl, etc.), and consequently there simply is no need to postulate the existence of a further property or a further natural kind of being alive.

This is not the place to defend a full-blown general eliminativism. So let me quickly *mention*, but not defend, some points that make it intuitively more acceptable – thus reinforcing the plausibility of a restricted eliminativism as applied to the question of life. First, we have just seen that eliminativism does not make us abandon our ordinary experience of the world, and that it is fully compatible with it. Second, it does not make us abandon ordinary language either. Indeed, the eliminativist can say that the word 'table' denotes a plurality of entities (a plurality of atoms) in the same sense as the expression 'the USS *Enterprise* crew' denotes a plurality of entities, rather than a single entity composed of the crew's members. The sentence 'There are no tables' is then true when it is a sentence uttered in Ontologese (the fundamental language of the metaphysician), but this is compatible with the sentence 'There is a table in my office' being true since it is a sentence in ordinary English. In Ontologese, it is *true* that there are atoms arranged tablewise in my office (that is, in 'atoms arranged officewise'), and this is all that is required for the ordinary English sentence 'There is a table in my office' to be true. This can simply be seen as a convention of ordinary English that whenever there are atoms arranged tablewise, it is true in ordinary English (but not in Ontologese) that there is a table. (Of course, more needs to be said in order to *defend* this view, but you get the idea.)

This is exactly the right thing to say when it comes to 'defining' life. We can, and we do, in our ordinary language talk about things which are alive and things which are not, and to some extent such a talk can even be scientifically useful, for instance if one starts with an arbitrary definition of life and tries to search in the universe for things that fit it. But we cannot, and we should not, think that any such

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definition picks out a genuine property in the world, or that it could. The core of my claim is then composed of several ingredients: (i) a methodological principle of parsimony (only postulate the existence of entities and properties when it is necessary), (ii) the vagueness of 'life' and 'is alive' understood as a linguistic – as opposed to metaphysical – phenomenon, (iii) the adequacy of an eliminativist strategy (which does not prevent us from talking about or interacting with living things), (iv) and, in general, the idea that the best explanation of why there is a problem with finding a satisfactory definition of 'life' is that being alive is not a genuine property. If it were in need of being summarized in a slogan, my claim would then go like this: *nothing is alive, we only say so*. The property of being alive simply doesn't exist, and the best reason for thinking this is that we don't need it.[11]

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Notes

[1] http://en.memory-alpha.org/wiki/Dikironium_cloud_creature

[2] http://en.memory-alpha.org/wiki/Beta_XII-A_entity

[3] http://en.memory-alpha.org/wiki/Data

[4] http://en.memory-alpha.org/wiki/Q

[5] See Deplazes-Zemp (2012).

[6] See for instance Lewis (1993: esp. 170), Heller (1996), and Schiffer (1998: esp. 198).

[7] See for instance Benovsky (2011).

[8] See for instance Lewis (1986).

[9] Van Inwagen is a relevantly interesting case in the context of our discussion, since he defends a type of eliminativism that makes *an exception* for, precisely, all and only living things. The cost of making this exception (let me take a short cut), is that it leads him to embrace the metaphysical view of vagueness, which I argued against in §4 above. (To compare, note that Merricks makes an exception for *conscious* entities, but that's a different thing.)

[10] One does not have in mind Democritean atoms, or Bohr's atoms; rather the eliminativist has in mind here something like 'fundamental components' whatever they actually are. The

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atoms are 'arranged tablewise' iff, if there were tables then they would compose a table.

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